# ALTERNATE CARE SITE
# PANDEMIC SURGE OPTIMIZATION PLAN

## A PLANNING GUIDE FOR THE DISTRICT OF COLUMBIA
## DEPARTMENT OF HEALTH
## HEALTH EMERGENCY PREPAREDNESS AND RESPONSE ADMINISTRATION


**PREPARED BY**

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# ACS SURGE OPTIMIZATION INTRODUCTION

## Background

The District of Columbia Department of Health (DOH), Health Emergency Preparedness Administration (HEPRA) has identified the need for technical assistance with the development of an Alternative Care Site Concept of Operations Plan (ACS CONOP) template. Originally conceived and developed under the direction of the U.S. Army Soldier and Biological Chemical Command's Biological Weapons Improved Response Program, the concept of operations for the Alternative Care Site (ACS) was "to be a supplement to the existing health care system in managing the overwhelming number of casualties that most likely would result from [acts of terrorism carried out by the use of weapons of mass destruction]."[1] As natural biological threats (pandemic influenza, SARS, etc.) have captured the public's attention, agencies charged with safeguarding the public's health have begun to recognize the key role that ACSs will play in their response to these types of events as well.

The purpose of this project is to provide the District of Columbia's Department of Health with a template that will aid in the development of a comprehensive and prescriptive response plan. This template incorporates best practices research and the unique characteristics of the District to provide an optimal approach to identifying appropriate locations, providing for adequate supply and staffing levels, and ensuring efficient operations.

# ACS INTRODUCTION

## Research

Several reports, policies and practices were used to synthesize the "best practice" activities outlined in this document. *Rocky Mountain Regional Care Model for Bioterrorist Events, Mass Medical Care with Scarce Resources*, and the District Response Plan were principle guiding documents. Braintree Solution Consulting reviewed plans and reports from national research institutes including the CDC, AHRQ, and other academic centers. This document reflects information gathered and verified from a variety of sources.

**It should be noted that the ACS template contained in this document can only be fully vetted through a practice exercise.**[2] Grants to support these activities may be obtained through HRSA and Urban Area Security Initiative funding.

# ACS GENERAL CONCEPT OF OPERATIONS OVERVIEW

## General Description

In the wake of a major pandemic or bioterrorist event, emergency public health managers will be responsible for providing medical care to thousands if not hundreds of thousands of causalities. Even when elective surgeries and non-critical inpatient services are discontinued in local hospitals and health centers, it is expected that the District's public health system will be overwhelmed by casualties and a significant number of psychosomatic ("worried well") cases. The ACS concept was developed in direct response to such a scenario.

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[1] S. Skidmore, W.T. Wall, and J.K. Church, *Modular Emergency Medical System: Concept of Operations for the Acute Care Center*, May 2003, v.

[2] S.J. Phillips and A. Knebel (eds.), *Mass Medical Care with Scarce Resources*, AHRQ Publication No. 07-0001 (Rockville, MD, 2007), p. 91.

The ACS concept provides an auxiliary medical treatment facility. As a modular facility, it can be set up quickly and easily dismantled once this surge has passed. The ACS templates which appear in this document are designed to help the local healthcare system cope while it is temporarily overwhelmed by a surge of patients. Therefore, the most basic function of the ACS is to augment the surge capacity of the District's emergency public health plan.

- This guide defines surge capacity as the ability of a health care system to rapidly expand beyond normal services to meet the increased demand for qualified personnel, medical care and public health in the event of a bioterrorism or other large-scale public health emergency or disaster.[3]

The ACS is designed to be flexible, with a scope of care and service function that can accommodate a variety of scenarios.[4] In addition to a general template, this document provides a planning guide for three different ACS designs:

- Low-Acuity Patient Care
  - Treats stable, low-acuity patients with observational or palliative care to relieve hospitals of patients who do not require acute treatment services or are too ill to benefit from them.
- Community-Focused Ambulatory Care Clinic
  - Serves as a mass vaccination / prophylaxis Point of Distribution (POD)
- Primary Triage Point
  - Determines which patients should be hospitalized, which can be sent home to recover, and which can receive observational, palliative, or minimal intervention care at the ACS

# ACS GENERAL CONCEPT OVERVIEW

## ACS Rationale

Hospitals routinely deal with surge by going on bypass or rerouting patients to other hospitals. However, a bioterrorist event or a pandemic could severely stress the system and overwhelm these traditional procedures. There are two results that can be expected from the inadequacy of these routine surge capacity systems:

- Medical care and access to medical care might become seriously compromised.
- The quality or the standards of medical care might have to change to meet the greatest good.[6]

The ACS is designed to meet these challenges by establishing a simple system that rapidly expands inpatient non-acute care facilities, integrates medical resources, and provides massive casualty management to a large population of patients.

[3] *Addressing Surge Capacity in a Mass Casualty Event*. AHRQ Publication No. 06-0027 (Rockville, MD, 2006).
[4] S.J. Phillips and A. Knebel (eds.), *Mass Medical Care with Scarce Resources*, AHRQ Publication No. 07-0001 (Rockville, MD, 2007), p. 81.
[6] Ibid.

# ACS GENERAL CONCEPT OVERVIEW

## ACS Scope of Care

The ACS concept is based on the assumption that the District's limited medical resources will have to be rationed until significant mutual aid or federal resources arrive.[7] To aid patient survival, the ACS must be set up quickly and maximize these resources by streamlining its level of care to provide the maximum good to the greatest number of people: 'Rather than doing everything possible to save every life, it will be necessary to allocate resources in a different manner to save as many lives as possible.'[8]

There are several reasons for limiting the level of care at the ACS:

- The primary focus on limited treatment simplifies the logistics of setting up these centers and reduces the amount of supplies and equipment the District will need to cache.
- 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.
- Hospitals have better access to staff (i.e. respiratory therapists, critical care, emergency, 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.
- 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.
- This limited supply of equipment also eliminates healthcare providers' dependence on technology to provide mass care.
- A free-standing ACS facility faces a number of logistical barriers that prohibit the use of certain specialized hospital functions. For instance, an ACS established in a school gymnasium, community field house, or hospital cafeteria will likely not have necessary access to free-flowing oxygen, medical air to drive ventilators, or specialized electrical outlets required to provide certain critical care-level therapies and basic supportive care.
- Streamlining the care provided at the ACS will allow healthcare providers of various backgrounds to follow pre-established treatment guidelines.
- Recommending that an ACS be able to provide the same level of care that can be offered by a hospital places an unrealistic burden on the District to provide unlimited resources (i.e. money, equipment, and personnel) to an ACS.[9]
- 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. Advanced lifesaving technology and treatment options will likely either be unavailable or unfeasible due to a lack of specially trained medical personnel.

[7] Skidmore, p. 6.
[8] *Altered Standards of Care in Mass Casualty Events*, AHRQ Publication No. 05-0043 (Rockville, MD, 2005), p. 2.
[9] Skidmore, pp. 6-7.

# ACS GENERAL CONCEPT OVERVIEW

## Challenges to Successful Implementation

Recent studies have identified several potential challenges to successful ACS implementation.[10] It would be useful to anticipate and address these potential issues during the planning stage. The following potential problems have been deemed the most significant:

- Regional, state, and local planning authorities lack clear guidance on a delineation of roles and responsibilities
- There may be conflicting institutional allegiances in the convergence of multiple actors which have not traditionally worked together (health care providers, hospitals, regional planners, emergency managers, local health departments, District health departments, etc.)
- The lack of inducements to create, drill, and execute the plan
- Health professional licensing and credentialing issues
- Lack of funding

# ACS SITE SELECTION

## General

It is strongly recommended that potential ACS sites be visited in person to examine physical characteristics and overall suitability. It is also recommended that emergency planning officials negotiate usage agreements with potential ACS facilities so they can be designated in advance of a mass casualty event.

# ACS SITE SELECTION

## Location / Hospital Proximity

The proximity of an ACS site to a hospital will have a major impact on costs and overall efficiency. Onsite resource requirements of an ACS increase in direct proportion to its distance from a supporting hospital. The ACS will function more efficiently and require fewer specialized resources if the facility is located near the supporting hospitals in the affected area. Therefore, the ACS should be set up as close to its supporting hospital as possible, allowing for more efficient patient transferring and laboratory and diagnostic resource sharing.[11]

# ACS SITE SELECTION

## Overall Size

Best practices require a minimum of 40,000 to 48,000 square feet for a standard 250 bed ACS.[12] These minimum ACS space requirements are based on the needs of the following functional areas:

- Communications
- Admissions/Registration
- Nursing subunits
- Multipurpose family/visitor area
- Multipurpose staff area

[10] See especially: Phillips and Knebel (eds.), pp. 78-79.
[11] Skidmore, p. 15.
[12] Skidmore, p. 15.

- Pharmacy medication preparation
- Supply storage and distribution
- Staff workstations
- Support services (storage, bathrooms, utility)
- Food services
- Maintenance
- Transportation dispatch and equipment
- Secure area (for patient valuables, deceased persons' belongings)
- Temporary morgue

# ACS SITE SELECTION

## Configurations

As might be required by patient surge, expanding to 1,000 bed capacity at an ACS may not be best suited for being located in a single building. It may be advantageous to spread the 1,000 bed capacity among two (each with two 250 bed pods) or four (each with one 250 bed pod) geographically diverse ACS sites within the District.[13] There are several configurations worth considering.

**Centralized Configuration**
The centralized ACS configuration calls for a single large scale ACS of 1,000 beds. The space minimum for a single centralized 1,000 bed ACS would require 160,000 to 192,000 square feet, assuming proportional scalability. Ideally the single ACS configuration would be centrally located to ensure accessibility.

***Advantages***

- The high volume centralized ACS configuration is well suited to a bioterrorist attack which deploys a highly lethal but relatively static or non-communicable pathogen (such as anthrax) and which causes numerous casualties within a concentrated central area (i.e. the Metro, the Mall, the Capitol, etc.)
- Patient transport to the ACS from a single bioterrorist event source will be easier to coordinate logistically
- Supplying and readying the facility will be less logistically complex
- Opportunities for greater efficiency and lower costs under the principle of scaled economies

***Disadvantages***

- The very large size ( >160,000 square feet) required by the centralized configuration will restrict the pool of buildings in the District that are available for consideration for ACS conversion as only a few buildings will satisfy the minimum space requirements; having fewer options may adversely affect the ACS designation and selection process
- In the case of geographically widespread casualties resulting from a communicable virus, the centralized facility may be difficult to access from all areas of the city
- May not be ideal if the nature of the pathogen necessitates quarantine, isolation, or non-isolation patient cohorts. Treating all patients in the same facility may not allow for a sufficient division of illness groups.

**Decentralized Configuration**
Another possibility is to divide demand for a 1,000 bed ACS into four 250 bed ACSs or two 500 bed ACSs.

[13] The minimum recommended size for an ACS is 250 beds.

***Advantages***

- In the event of a city wide pandemic of a communicable pathogen, whether caused by bioterrorism or otherwise, a decentralized ACS configuration with several locations may present a more readily accessible option to geographically diverse populations.
- The smaller size requirement may provide emergency planners with more potential ACS sites to choose from which will assist in the ACS designation and selection process
- Having more than one ACS location may be better suited to patient illness cohorts (quarantine, isolation, non-isolation)

***Disadvantages***

- Coordinating patient transport to several ACS facilities from a single bioterrorist event source will be logistically challenging
- Supplying and readying each site will be more logistically complex

**Neighborhood / Community Based ("It Takes a Village") Configuration** [14]

During the DC Pandemic Influenza Medical Surge Capacity Tabletop Exercise (6/28/07), a number of participants strongly suggested that surge augmentation facilities would benefit from a community level design which relies on outside medical supply sources but which is driven by local actors working for and on behalf of their own neighborhood. This system may be based on the thirty-nine (39) pre-existing DC neighborhood clusters currently used for budgeting, planning, service delivery, and analysis purposes. Under this configuration, the ACS would become just one part of a comprehensive community based public health emergency response which might also include food distribution, child day care, etc.

***Advantages***

- Transporting patients to and from Hospitals, NEHCs, and ACSs would become largely unnecessary as all patients would be treated within their immediate neighborhood
- While only a third of available medical personnel are expected to show up for a serious public health emergency, the community based configuration is expected to achieve a much higher rate of staff participation because of its local nature. It is assumed that there is a greater incentive for local staff (such as retired nurses, physicians, police officers, etc.) to participate when:
    - staff know they will be 'taking care of their own'
    - leaving for work does not mean leaving a sick family member far away
- Local know-how and 'connections' will be helpful in obtaining supplies, facilities, etc.

***Disadvantages***

- Communities may have disparate resource capacities. Level of care may not be the same across the District.
    - The Grass is Always Greener Syndrome: The system will break down if patients ignore community boundaries and seek care in neighboring communities where resources are perceived to be more abundant or of a higher quality.
    - In desperate situations, one community may raid supplies from a better resourced neighboring community.
    - Perceptions about race and equal access to services may create difficulties both during and after the emergency.
- The configuration assumes the local community is willing and able to put together a logistically complex plan responsible for the health and safety of everyone in their neighborhood.
- Transient groups (homeless) may not know where to go for help.
- This configuration has not been vetted in the literature and the plan of operations is still vague.

[14] This configuration is a major departure from most ACS concept of operations literature.

# ACS SITE SELECTION

## Accessibility

**Access Points**

- The admissions/registration area should be located on the ground floor with a wheelchair accessible entrance.
- The reception entrance must be clearly signed (in both English and Spanish) and should be visible from all approaches.

**Parking**

- The main car parking lot should be well lit and situated as close to the main entrance as possible.
- The main car parking lot should be used for patients, their relatives, and ACS staff.
- The curb by the front entrance of the building should be well marked with appropriate signage and should be designated as a loading zone for ambulances and buses that drop off and pick up patients.
- The parking lot must also contain designated parking areas for the following categories
    - Police vehicles
    - Logistical re-supply vehicles
    - Ambulances that are not in use
    - Taxis and private vehicles to pick up patients (including those with limited mobility)
    - Family and other visitors
- A separate security patrolled parking lot should be reserved for ACS staff

# ACS SITE SELECTION

## Layout

**Design Overview**

- Ideally, the nursing subunits should be centrally located and easily accessible from the admissions area.
- Logistical support and communications offices should be arranged around the periphery of the nursing subunits or on the upper floors of the building. They should have access to the nursing subunits but should not impair the clinical functions of the ACS.
- Rooms must have adequate space for personnel and equipment to enter, exit, and maneuver.

**Traffic Patterns (Patients and Supplies)**

- It is important to have rapid access to every area with a minimum of cross-traffic
- Close proximity between the admissions area and the nursing subunits will assist in managing high volume intake periods.
- Visitor and patient routes to public areas should avoid passing through clinical areas in order to assure patient privacy.
- All workstation and functional offices should be located where they do not impede patient flow or patient care.

**Bed Spacing**

- There should be at least 2 feet of floor space between all beds
- There must be enough room to allow for routine care and patient/staff access
- The space between the head of each bed could conveniently be used to store disposable/non-disposable medical supplies. Modular plastic bins or similar storage solutions would be ideal.

**Best Practices:**
**Lessons from Hurricane Katrina 2005**
Beds within the nursing subunits should be organized in a grid system which 'allows clinicians to make rounds and know exactly where to find a patient (e.g. bed A4)'
- Phillips and Knebel (eds.), p. 92.

**Medical Gas / Oxygen Provisions**

- It is expensive and logistically complex to supply medical gases in any facility.
- If it is decided to provide medical gases (oxygen) at an ACS, which will most likely not have pre-existing internal medical gas lines, emergency planners should consider developing a multiple branch-line system which pipes oxygen directly to each nursing subunit. Portable cylinders may prove useful in establishing a temporary liquid oxygen manifold system. It is recommended that emergency planners involve a biomedical engineer in the setup of any such oxygen delivery system.

## ACS SITE SELECTION

### Infrastructure

**Doorways and Corridors**

- Doors should be wide enough to easily accommodate wheelchairs and wheeled stretchers as well as any intravenous poles that may be attached.
- Corridors should be wide enough to allow two-way traffic of stretchers.

**Electricity Supply**

- Must be surge protected to protect computers and electronic equipment
- Medical equipment and computers must have access to emergency power
- If not present on site, emergency generators and uninterruptible power supply (UPS) units should be included in the ACS supply list
- Ideally, would have specialized electrical outlets required to provide critical care-level medicine

**Heating and Air Conditioning**

- Must have climate control

**Lighting**

- Clinical areas must have adequate artificial lighting in order to perform procedures, assessments, and other forms of direct patient care.
- Natural sunlight can minimize patient and staff disorientation.

**Floor Coverings**

- Must be durable, non-slip (no carpeting) , and impermeable to water and bodily fluids

**Hand Wash Facilities**

- If water is available, hand washing basins should be readily accessible to patient care areas at the ratio of one basin for every 10-25 beds
- If water is not available, alcohol-based hand cleansers should be distributed
- A combination of these methods would also be effective

**Refrigeration**

- The facility must have onsite refrigeration capabilities or it should have an electrical supply sufficient to power temporary refrigeration units

**Storage Capacities**

- Must have space sufficient to unload and distribute the incoming supply cache
- Ideally, the facility should have a secure loading zone area which can accept large scale shipments of medical supplies, equipment, and food
- Must have space sufficient to temporarily store bio-hazardous waste

## ACS SITE SELECTION

### Site Security

Many facilities can be secured with adequate law enforcement personnel. However, security personnel may be in short supply during a pandemic or bioterrorist attack scenario for numerous reasons. Choosing a building which is easily securable may reduce the number of security personnel required and/or enhance security performance.

The following site characteristics would be helpful:

- Secured entrances and exits
- Adequate outdoor flood lighting
- In addition to the standard outer security perimeter, a building which can easily accommodate an inner security perimeter would be useful in separating the nursing subunits and administrative sections from the admissions/registration area
- The ability to lockdown the facility

## ACS SITE SELECTION

### Potential Site Categories

*Rocky Mountain Regional Care Model* developed an ACS site selection matrix tool to assess the suitability for ACS conversion of a variety of facilities.[15] Ideally, an ACS should approximate the same level of service and functionality as a hospital. With this in mind, the tool allows the user to make a direct quantitative assessment of the most important criteria necessary for a properly functioning ACS. See appendix C for details.

Emergency public health planners may wish to consider the following facilities for ACS conversion:

**Schools**

High schools and middle schools generally offer a better layout with more on site facilities than elementary schools.

***Potential Advantages***

- Schools have parking lots, long wide corridors, large separated classrooms, private administrative offices, and other immediately available resources such as tables and chairs and offer an ideal physical structure that can meet most clinical needs.

[15] See Appendix C.

- Schools also have cafeterias, bathrooms, lounge facilities, backup generators, shower facilities, public address systems, laundry facilities, loading ramps, and communication links.
- Considering that most high schools are public facilities, they may be easier to commandeer in an emergency. It will likely be easier to negotiate standing usage agreements as well.

***Potential Disadvantages***

- When needed, they may have a school population present, which can complicate logistics (evacuation of school will mean an influx of parents; may need to wait until each child has left the building before any inpatient services can begin)
- There may be a lasting stigma attached to any future use of a building which has been used as an ACS where communicable pathogens/agents were potentially present. This effect will likely be amplified because children are involved. Parents may be hesitant to send their children to a school which has been an ACS. Additional decontamination measures may be necessary to satisfy the community of the building's safety.

**Enclosed Large Scale Spaces (Convention Centers, Sports Arenas, etc.)**

***Potential Advantages***

- Easily identifiable and well known to the public
- Large gathering space sufficient to accommodate high volume traffic
- Pre-existing public transportation links and large parking areas
- Offer the possibility of centralizing the ACS into one large facility (may or may not be appropriate)
- Have food preparation areas, large capacity restrooms, backup generators, climate control, public address systems, and advanced communication links, such as satellite and broadcasting capabilities.
- Sports arenas have laundry and shower facilities in their team locker rooms

***Potential Disadvantages***

- Securing the site and all of its areas may be challenging because of the large size
- Large potentially uncontrollable central space may be susceptible to stampeding in the case of a riot or general panic

**Hotel Conference Rooms**

***Potential Advantages***

- Has access to beds, tables, and chairs
- Large open space
- Climate control, backup generators, various amenities, large storage space, access to laundry facilities, kitchens, and large capacity restrooms.

***Potential Disadvantages***

- Private hotels may not be willing to serve as an ACS and may be difficult to commandeer in an emergency.
- Patients and stretcher traffic may find it difficult to access the conference room from the hotel entrance.

**Churches / Religious Spaces**

***Potential Advantages***

- Easily identifiable and well known to the public
- May have large event halls

***Potential Disadvantages***

- Layout may not be ideal. Pews may obstruct the flow of patients / staff and limit the utility of the main worship area
- Churches already provide an important function in a time of crisis and they may be needed by the community to offer support for those affected

**University Gymnasiums**

***Potential Advantages***

- May already be situated near a university hospital
- Large open space
- Likely to have shower facilities
- Has access to extra man power (university athletic teams)

***Potential Disadvantages***

- May not be willing to serve as an ACS site unless it is a public institution

**Veterinary Hospitals**

***Potential Advantages***

- Will likely have preexisting medical facilities (sterile environments, medical gas pipelines, medical equipment, electrical capacities, etc.) which can easily be converted for human purposes.[16]

***Potential Disadvantages***

- Readying the facility will likely require evacuating all animals on site
    - Finding a temporary shelter for all animals on site may be a challenge

[16] Phillips and Knebel (eds.), p. 93.

# GUIDELINES SPECIFIC TO THE DISTRICT OF COLUMBIA

## General Demographics and Implications

HRSA has set a critical benchmark for all States to establish a system that allows for the triage, treatment, and disposition of 500 adult and pediatric patients per 1 million population who suffer from acute illness or trauma requiring hospitalization from a biological, chemical, radiological, or explosive terrorist incident. HRSA also requires that States establish a response system that allows for the immediate deployment of 250 or more additional patient care personnel per million population in urban areas, and 125 or more additional personnel per million in rural areas" [17]

**Demographics of the District of Columbia**

**Table 1** below was developed by the DC Office of Planning using Census and employment data for the District. It is specific to the boundaries of the District's eight Wards and includes all types of employees in the District during the day (federal, DC government, private sector, etc.) as well as an average annual rate of visitation by tourists. It is notable that Ward 2 would absorb a disproportionate number of employees and visitors who reside outside of the District.

**Table 1 Estimated Daytime Population (Including Workforce) for Washington, DC**

| | |
|---|---|
| Residential population (Census 2000) | 572,000 |
| Total employment (COG 2000 forecast) | 678,000 |
| DC residents in labor force (Census 2000 Supplementary Survey)* | -294,000 |
| Tourists (Annual 2000 figure divided by 365 from DC Convention & Visitors Association) | 53,000 |
| | |
| **Daytime Population** | **1,009,000** |

Prepared by DC Office of Planning/State Data Center

* DC residents working outside DC are obviously excluded; those working in DC are excluded because they are already counted in the residential population.

**Disabled Populations**

Accessibility for all populations is a key component of site and staff selection for an ACS. First, the site must provide access to populations with disabilities that limit mobility (i.e., wheelchair bound populations). Second, staff must be able to assist populations with disabilities that inhibit their ability to perform essential tasks such as read and complete standardized forms and/or navigate the patient flow paths of the ACS (i.e., blind or deaf populations). Table 2 provides an estimated breakdown by Ward of the disabled populations of DC. The ward specific populations presented in Table 2 are an estimated percentage of the disabled population and are compiled using datasets from the 2000 US Census Bureau decennial survey and the American Community Survey (ACS) provided by the DC Department of Planning. These percentages have been estimated due to the fact that some parameters of these sources exhibit slight variations with regards to population groupings. For example, the disabled population dataset groups populations by ages 5-15, 16-64 and 65 and over; whereas the 2000 Census Survey uses the following groupings 5-17, 18-24, 25-34…65+ for population totals. In addition this information is provided by census tract. Braintree has been asked to provide ward specific information, thus we have attempted to translate census tract boundaries into the corresponding District of Columbia Wards. However, as some census tracts overlap ward boundaries it is challenging to develop an accurate assessment of the disabled populations by ward. Therefore the estimates in Table 2 represent Braintree's

[17] *Optimizing Surge Capacity: Hospital Assessment and Planning*. AHRQ Publication No. 04-P008 (Rockville, MD, 2004).

best efforts to synch the information provided in these datasets. The methodology used is illustrated below. We recommend that the appropriate department prepare a more accurate survey prior to developing any specific plans.

*Age groupings:*
To overcome the incongruities highlighted above, BSC converted the 2000 Census Survey age groupings to match the disabled population dataset age groups. The following list illustrates the calculations used to correct these incongruities:

- Calculations for Ages 5-15" – The grouping "Ages 5-17" represents 13 distinct ages and the grouping "Ages 5-15" represents 11 distinct ages. Each age is 7.7% of the total group (100/13). The population total for "Ages 5-17" was multiplied by 84.7% (7.7*11) to calculate the population for "Ages 5-15"
- Calculations for "Ages 16-64" – The population total "Ages 5-17" was multiplied by 15.4% (7.7*2, the remainder of distinct ages from the previous calculation) and the results were added to the age groupings that included ages 18-64.

*Geographical Boundaries:*
To overcome the challenges posed by census tracts that overlap ward boundaries BSC divided the population of the offending census tract by the number of overlapping wards and added the results of this division to the appropriate ward. All census tracts that overlap ward boundaries overlap a maximum of two ward boundaries. Thus all calculations for this conversion were total population/2.

Defining Disabilities [US Census Bureau]
The US Census Bureau defines disability as, "a long-lasting physical, mental, or emotional condition… [that] can make it difficult for a person to do activities such as walking, climbing stairs, dressing, bathing, learning, or remembering. This condition can also impede a person from being able to go outside the home alone or to work at a job or business." The Census Bureau has identified six categories of disability. The relevant dataset for DC highlights four of these categories; sensory limitations, physical limitations, mental limitations and employment limitations. The following list provides definitions for each category included in the DC population tables.

- Sensory limitations – "blindness, deafness, severe vision, or hearing impairment."
- Physical limitations – "a condition that substantially limits physical activities such as walking, climbing stairs, reaching, lifting, or carrying."
- Mental limitations – "a physical, mental, or emotional condition lasting 6 month or more that made it difficult to 'learn, remember, or concentrate.'"
- Employment limitation – "a physical, mental, or emotional condition lasting 6 months or more that made it difficult to 'work at a job or business.'"

**Table 2 Disabled Population**

**Population Totals by Types of Disabilities and Age Group**

| | Sensory Disability | | | Physical Disability | | | Mental Disability | | | Employment Disability |
|---|---|---|---|---|---|---|---|---|---|---|
| Ward | Ages 5-15 | Ages 16-64 | Ages 65 and Over | Ages 5-15 | Ages 16-64 | Ages 65 and Over | Ages 5-15 | Ages 16-64 | Ages 65 and Over | Ages 16-64 |
| 1 | 104 | 1132 | 781 | 82 | 2814 | 1881 | 398 | 2275 | 787 | 7506 |
| 2 | 1258.5 | 718 | 835 | 31 | 1640 | 1585 | 171 | 1401 | 685 | 4749 |
| 3 | 15 | 488 | 904 | 11 | 1395 | 1646 | 169 | 785 | 620 | 3217 |
| 4 | 55 | 1008 | 1147 | 143 | 2542 | 3203 | 542 | 1783 | 1053 | 7948 |
| 5 | 110 | 1907 | 1192 | 71 | 3698 | 3605 | 531 | 2142 | 1502 | 7608 |
| 6 | 55 | 1261 | 837 | 97 | 3028 | 2267 | 381 | 1938 | 1116 | 5485 |
| 7 | 79 | 1188 | 954 | 198 | 3890 | 2929 | 670 | 2255 | 1047 | 8385 |
| 8 | 206 | 1350 | 622 | 247 | 3950 | 1498 | 919 | 2282 | 540 | 7922 |

**Ward Totals**

| Ward | Sensory Disabilities | Physical Disabilities | Mental Disabilities | Employment Disabilities | Total Disabilities |
|---|---|---|---|---|---|
| 1 | 2017 | 4777 | 3460 | 7506 | 17760 |
| 2 | 2812 | 3256 | 2257 | 4749 | 13074 |
| 3 | 1407 | 3052 | 1574 | 3217 | 9250 |
| 4 | 2210 | 5888 | 3378 | 7948 | 19424 |
| 5 | 3209 | 7374 | 4175 | 7608 | 22366 |
| 6 | 2153 | 5392 | 3435 | 5485 | 16465 |
| 7 | 2221 | 7017 | 3972 | 8385 | 21595 |
| 8 | 2178 | 5695 | 3741 | 7922 | 19536 |

DC Department of Planning

2000 US Census Bureau Decennial Survey

2000 American Community Survey - US Census Bureau

# ACS GENERAL OPERATIONS

## ACS Site Activation

Local or regional (as opposed to institutional) level emergency public health management must decide whether, when, and where to activate the ACS plan based on medical systems capacity and the expected surge resulting from the specified viral threat.[18]

The expected surge will be based on the following factors:

- The volume of cases
- Time as a function of the volume of cases
- The complexity of cases involved [19]

Each virus strain has a unique surge signature, depending on such factors as the number of people initially infected, the incubation period, the duration of the illness, lethality, communicability, and various other intangible factors, such as the notoriety of a given strain which will affect the number of psychosomatic ("worried well") cases presenting at local hospitals and NEHCs. The ACS should be activated if the expected surge factors exceed routine medical systems capacity by pre-specified figures.

# ACS GENERAL OPERATIONS

## Communications

Communications are a vital component to any properly functioning emergency public health system. Former Assistant Surgeon General Edward Baker commented in December 2001:

> …the major public health challenges since 9/11 were not just clinical, epidemiological, technical issues. The major challenges were in communication. In fact, as we move into the 21st century, communication may well become the central science of public health practice.[20]

It is important to have a pre-planned communications structure in place before the ACS activation decision is made. Ideally there will be a unified command communication system that can coordinate not only the activation of an ACS (or multiple ACSs) but also enable emergency public health management to apply consistent and responsive approaches to care in a fast moving and constantly shifting environment.

- **Health Alert Network (HAN)**

  One such integrated communications approach is the Health Alert Network (HAN), which has been developed by the Centers for Disease Control and Prevention (CDC): "HAN is a nationwide program that establishes the communications, information,

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[18] Phillips and Knebel (eds.), p. 82.
[19] *Addressing Surge Capacity in a Mass Casualty Event*. AHRQ Publication No. 06-0027 (Rockville, MD, 2006).
[20] S.V. Cantrill, S.L. Eisert, P. Pons, and C.E. Vinci, *Rocky Mountain Regional Care Model for Bioterrorist Events*, (August 2004), p. 61.

distance learning, and organizational infrastructure for a new level of defense against health threats."[21]

The District is currently in the process of reorganizing HAN. Once complete, it is anticipated that the network will link high level agencies (DOH and CDC) to local medical facilities such as hospitals and clinics.

- **Health Emergency Coordination Center (HECC)**

  Situated within the Department of Health, the HECC is the District's command and control facility for all public health emergencies.

- **Emergency Operations Center (EOC)**

- **EOC Joint Information Center (JIC)**

- **WebEOC**

- **Alert DC**

  The Alert DC system uses the Roam Secure Alert Network to inform the public during a major crisis or emergency. The system delivers simultaneous public alerts via the following methods:

  - e-mail
  - cell phone
  - pager, BlackBerry
  - wireless PDA (Palm, etc.)

  This system can alert the public with real-time updates, instructions on where to go, what to do, or what not to do, who to contact and other important information.

## ACS GENERAL OPERATIONS

### Risk Communication Considerations

Emergency planners should consider the following risk communication categories as a supplement to effective ACS operations:

- Risk Communication [22]
  - Actively informs the public about the health emergency "…first, to provide knowledge and understanding of the situation at hand, second to enhance trust and credibility between the public and responders, and third to encourage constructive dialogue" [23]

[21] Phillips and Knebel (eds.), p. 83.
[22] For a comprehensive guide to risk communication see: B. Reynolds, *Crisis and Emergency Risk Communication* (Atlanta, 2002).
[23] Cantrill, p. 62.

    - Provides the public with appropriate action guidelines (if any such action is deemed necessary)
    - Minimizes confusion and anxiety
    - Limits the burden placed on health systems by those who will seek out such information on their own and thus increase the surge capacity need
        - Public information officers (PIOs) should direct non-critical patients away from hospitals whenever possible

- Health Information Communication
    - Answers specific questions and concerns through call centers and hotlines
    - Minimizes the calls received elsewhere in the public health system

It is of paramount importance that all emergency communications with the public be accurate, frank, and current. Indeed, the public should be viewed as a partner and ally during a health emergency rather than "the problem to be managed."[24] Any public perception that emergency communications are inaccurate, vague, or out of date will not only be counterproductive to the goals of risk communication theory but may also add to the general burden on health systems by creating an atmosphere of mistrust:

- Rumors and hearsay will fill perceived information vacuums
- The public may become uncooperative, adversarial, confrontational, or even mutinous

Psychological stress associated with a public health emergency will likely have a significant impact on how the public interprets and comprehends communications. There are four major risk communication theories which define and attempt to overcome specific psychological obstacles which may be expected in a public health emergency:

- Mental Noise Theory
    - In highly stressful emergency situations, people often find it difficult to hear, understand, and remember information.
    - Communications should therefore be brief, clear, and concise.

- Trust Determination Theory
    - In highly stressful emergency situations, people often question whether communicators are: caring, listening, empathetic, competent, open, honest, hard working, and expert.
    - Trust may be established by 'demonstrating compassion, empathy, conviction, courage, hope, and optimism.'[25]

- Negative Dominance Theory
    - In highly stressful emergency situations, people often fixate on negative information over positive information.
    - It is suggested that every negative statement be followed by three positive statements
    - Granting some element of control to the public through positive statements which encourage action may be effective.

- Risk Perception Theory

[24] Cantrill, p. 62
[25] Ibid., p. 63.

- In highly stressful emergency situations, lay person perceptions often differ from expert perceptions, creating pre-existing discrepancies in understanding of the threat at hand and its prognosis.
- Those in a position of leadership need to be sensitive to this perception gap in communicating with the public.

## ACS GENERAL OPERATIONS

### Communications Reliability

Communications failures can adversely affect the overall success of the ACS. Therefore any emergency communications system of which the ACS is a component should seek to incorporate redundant (backup) capacities. Emergency planners may wish to consider some of the following possibilities in establishing the system:

- Dedicated land lines
  - Requires a pre-selected ACS in order to install the proper wiring
  - Secure communication

- Cellular phones
  - Highly mobile
  - Battery life dependent
  - Cellular network dependent (may be overloaded during a crisis)
  - Semi-secure communication

- Handheld 2-way radios
  - Highly mobile
  - Battery life dependent
  - Non-secure communication

- FM/AM radio broadcasting
  - One way communication capacity
  - Widespread dissemination of information
  - Non-secure communication

- Local HAM operators
  - Two way communication capacity
  - Non-secure communication

# ACS GENERAL OPERATIONS

## Threats to Patient Flow and Optimal ACS Performance

As with any ad-hoc system, the ACS will be subject to unforeseen operational difficulties. Planning experts have always held that "a battle is won or lost before the first shot is fired." This is certainly a sentiment appropriate to the planning and transformation of a commonly used facility - such as a school - into an efficiently and effectively functioning ACS. But while planners cannot always predict every scenario that may unfold once a facility begins operations, it is clear that a few threats to optimal functioning exist and bear mentioning. While the following is by no means an exhaustive list, some of the potentially undermining factors – or "dysfunction multipliers" - to ACS operation include:

- Ambient noise within the ACS due to poor acoustics and extensive use of bull-horns
- The possibility of early arrivals at the ACS or others who arrive at the facility in unanticipated ways (especially when Staging areas are used). Early arrivals can disrupt staff orientations and greeting/registration functions and cause bottlenecks. Unanticipated arrivals can have a similar effect on bottlenecking and, like early arrivals, can also lead to public disruption [Lesson learned from Philadelphia flu clinic 10-7-05]
- Most if not all of the staff will be unfamiliar with the layout of the building
- Unruly and/or disruptive patients (intentional and unintentional)
    - The ACS should establish clear rules of acceptable behavior for patients, staff, and family members to handle such issues [36]
- Poor visibility for patient flow staff and others directing client traffic
- Poor verbal or written communications among staff and their interaction with patients
- Separation of spouses/family members/friends that cause stress and their movement through the facility in ways that congest halls or exacerbate patient frustrations/stresses

# ACS GENERAL STAFFING

## Staff Recruitment

The ability to recruit staff depends on the scale and geographic range of the public health emergency. Generally speaking, the more geographically widespread the event, the more difficult it will be to find available medical personnel. The pandemic scenario, therefore, is very

[36] Phillips and Knebel (eds.), p. 91.

troubling. Staffing the ACS with medical personnel from the afflicted area will be a challenge for a number of reasons:

- Local medical personnel will already likely be inundated by patients in their routine medical settings [37]
- Normally available local medical personnel will not necessarily make themselves available in the event of a bioterrorist attack or pandemic outbreak, fearing for their own safety and/or the safety of their families
- The locally afflicted environment may be chaotic and normal systems may not function

It must then be assumed that the majority of ACS staff will have to come from sources outside the afflicted area.[38] However, in a pandemic scenario, outside assistance will not likely be forthcoming.

Finding an adequate number of medical professionals to staff an ACS requires creative preplanning. There are several methods which can provide ACS staff:

**Regional Hospital Alliance – "The Pot-Luck Approach"**

- Each participating hospital pre-designates a small contribution of medical personnel which in aggregate provides an ACS with a full level of staffing.[39] The alliance must be organized to balance the number and ratio of required medical personnel categories: physicians, nurses, social workers, administrators, etc. The small number of staff required from each participating hospital will minimize impact on normal functionality.

**Emergency Systems for Advance Registration of Volunteer Health Professionals (ESAR-VHP)**

- Helps to address the issues of medical personnel verification and credentialing.[40]
- Provides a simple way of identifying large numbers of properly credentialed medical personnel in a given region.

**Mutual Aid Agreements**

- The District should negotiate mutual aid agreements with Virginia and Maryland that specify where additional staff may be obtained while awaiting the arrival of federal resources.

**Regional MOUs and Executive Orders**

- MOUs with Virginia and Maryland and presidential, congressional, or mayoral orders which free physicians and other medical personnel from specific aspects of District health professional licensing requirements should be prepared and ready to sign in the event of a bioterrorist attack or other such public health emergency.[41]

**Inactive Medical Personnel Registry**

- A registry of currently non-practicing healthcare practitioners, such as those who are licensed but retired or are working in an alternative line of work, or otherwise inactive

[37] Cantrill, p. 35.
[38] Skidmore, p. 19.
[39] Phillips and Knebel (eds.), pp. 88-89.
[40] Ibid.
[41] See appendix for sample executive orders.

but who would be able to provide medical expertise in the event of a public health emergency.

**Medical Reserve Corp (MRC)**

- "In 2005, more than 1,500 MRC members were willing to deploy outside their local jurisdiction on optional missions to hurricane-affected areas with their state agencies, the American Red Cross, and HHS."[42]

**Faith-Based Community and Community Health Workers**

- May provide a dedicated source of volunteers

## STAFFING THE GENERAL ACS

### Staff Orientation and Training

Orientation and training is necessary for staff to operate effectively within the ACS. The effectiveness of this training will play a significant role in the overall success of the ACS. At the very least, all staff members should receive some basic training which covers the mission of the ACS, a building orientation and walk-through, the command structure and organization breakdown, and standard ACS operating procedures and any non-routine specifications therein. Ideally staff should receive this training before their first shift but it is possible that an abbreviated or impromptu on-the-fly orientation may become necessary.

**Best Practices:**
**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. Disaster situations are unpredictable and extremely variable. These aspects, coupled with staff turnover, excitement, anxiety, and feelings of urgency or haste may confuse even experienced personnel. Roles are easily forgotten in the urgency of the moment. Job Action Sheets are used in addition to the extemporaneous training to teach staff what to do; when to do it, and to whom they report. 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."
- Skidmore, p. 22.

All orientations should be given by the appropriate manager. In the case of clinical staff the Patient Care Coordinator (PCC) or the pod manager will give the orientation. Non-clinical (administrative) staff will receive their orientation from their respective unit manager.

As a minimum, training must cover the following points:

- Information on the agent and treatment modalities

[42] Phillips and Knebel (eds.), p. 88.

- Personal protective measures, including infection control measures (handling and disposing of infectious waste, agent-specific transmission prevention measures, etc.)
- Standard operating procedures
- Standard reporting procedures
- Response to outside requests for information
- Patient confidentiality

At the end of the first 12 hour ACS shift, new staff may not have the opportunity to attend a formal orientation for various reasons (ie. the high workload, the chaotic situation, etc). In this case, it is suggested that the relief staff arrive 30 minutes early in order to shadow those staff whose shifts are about to end, thereby transferring as much on the job training as possible before taking over full responsibilities.

Given the novelty of the ACS setting and its unique circumstances, many of the skills and know-how developed by the first staffing shift will be cutting edge and possibly exemplary. These skills will be invaluable to the staff sent to replace the first shift. Effective knowledge transfer between shifts, especially between the first and second 12 hours of operation, will be critical.

## STAFFING THE ACS

### Staffing Recruitment Considerations

Emergency planners may wish to provide ACS staff with onsite or nearby housing, especially as many will come from outside of the area.

The following table lists some general considerations for staffing and their relevant state, local, and institutional jurisdictions.

**Jurisdictional Considerations for Staff Recruitment** [43]

| | State | Local | Institution |
|---|---|---|---|
| Establish legal authority to utilize out-of-state licensed personnel | X | | |
| Establish supervision criteria for volunteer and out-of-state licensed personnel | X | | |
| Establish/maintain list of retired individuals who could be called upon to staff | X | X | X |
| Availability of prophylaxis for employees and volunteers (? and their families) to guarantee workforce availability | X | X | X |
| Communication of institutional workforce plan in advance to employees | | | X |
| Develop, test and maintain emergency call-in protocol | | X | X |
| Expectation and capacity for flexibility in roles | X | X | X |
| Establish linkages with community resources (e.g., hotel housekeeping) | | X | X |
| Address specific needs of employees (transportation, single mother, pets) | | | X |
| Implement a reverse 911 or notification system for all employees | | | X |
| Establishment of institutional policies for credentialing of non-employees | | | X |

[43] Skidmore, pp. 19-20.

# THE LOW ACUITY CARE CONOPS

## Introduction

The low-acuity ACS is designed to accept patients for whom acute care is inappropriate. Patients at a low-acuity ACS, most of whom are not expected to survive, will receive observational or palliative treatment that requires a minimum of medical intervention.

# OPERATIONS

## Alerting the Public about the ACS

Emergency health managers may wish to mention the activation of the low-acuity ACS in communications with the public. Although the ACS, in this capacity, is a post-triage facility and therefore not to be used for primary treatment, public awareness of the patient distribution process and the reasoning behind it can be of benefit to overall emergency health systems effectiveness.

However, public communications should avoid specifying the location of any ACS for several reasons:

- Securing the ACS site may become more problematic
- The ACS may become inundated with non-triaged patients seeking general treatment

Possible rationale (not recommended) for publicizing the location of the ACS:

- Despite best efforts, the public will inevitably learn the location of the ACS through word of mouth
- If the public health system breaks down and becomes disorganized or chaotic under severe conditions, emergency public health managers may wish to redefine the purpose of the ACS in terms of simple surge capacity augmentation.
- Under this scenario, the ACS would become a general medical resource to casualties of a pandemic or bioterrorist attack, much like an Alternative Care Center.

Whatever decision is taken, there are various ways to alert the general public, including:

- reverse 911
- public access
- public service announcements
- emergency broadcast system
- community resource officers in neighborhoods

*Worried Well:*
"To prevent an unnecessary surge of worried well patients, Stephen Cantrill stressed the importance of proper communication of risk. Brad Austin added that hospitals could interact with local mental health systems to create a system to take care of these individuals. The University of Pittsburgh Medical Center Health System has developed a psychological SWAT team for the

acutely anxious, quarantined people with cabin fever, and for staff (for example, cooks or custodians) who have become mutinous as a result of misinformation."[44]

Emergency officials will communicate with the medical community during preplanning activities and during recognition of an event to assure healthcare workers that their safety and the safety 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.

- Physicians, nurses, and other licensed medical personnel will need to be quickly credentialed following pre-established policies. This function is best carried out by the office of emergency management of the respective community, in conjunction with local sponsoring hospitals, before staff arrive at the ACS itself.
- Preplanning and sensitive surveillance systems are vital in reducing the impact that a bioterrorist event will have on the District. The better the surveillance system and preplanning, the more likely the ACS will have a positive impact and outcome following the event.[45]

## OPERATIONS

### Patient Distribution

Casualties of either a bioterrorist attack or a pandemic will first arrive for triage at the NEHC or Hospital ED (or Triage Point ACS if this design is activated). NEHC and Hospital EDs will notify the Medical Command Center (MCC) which will determine where these patients will be admitted (low-acuity ACS or Hospital). The MCC will advise the Casualty Relocation Unit (CRU) and/or ambulances of the determined admission location and will alert the ACS of the number of incoming patients expected and other pertinent logistics such as how many patients require transfer by stretcher versus wheelchair.

## OPERATIONS

### Patient Cohorting

In general, the ACS is designed to offer basic treatment or observational care to victims of a pandemic. However, within this group there may be patients affected in ways which may or may not make them good candidates for an ACS. The exact specifications of who should be directed to an ACS should be a matter for emergency health planners to decide and would most likely depend on the type of virus and the extent to which the surge exceeds routine hospital capacity. Whatever decision is taken regarding the type of patients to be accepted for treatment at an ACS, the restriction of patient type serves two purposes:

- It enables the ACS to follow a streamlined approach to patient care. Similar patient types will require similar treatments which follow pre-established critical pathways or clinical practice guidelines.

[44] *Optimizing Surge Capacity: Hospital Assessment and Planning*. AHRQ Publication No. 04-P008 (Rockville, MD, 2004).
[45] Skidmore, pp. 2-3.

- In situations where isolation is desirable but impractical, cohorting patients with similar infections/exposures/stages of the same disease in one location limits exposure of non-infected persons.[46]

# OPERATIONS

## Admissions Procedures

Incoming ACS patients should be directed to the admissions/registration area. The Patient Care Coordinator (PCC) should rapidly evaluate and assign a nursing subunit bed to each patient, who should be given an admissions packet that includes preprinted standing admission orders.[47]

**Best Practices:**
**Paper Based Documentation**
"Given the extraordinary conditions that will exist to require the use of [ACSs] for patient care delivery, only modest means for patient care documentation should be expected to be used. Electronic medical records are not likely to be available or practicable, particularly given the learning curve associated with their use and the dependence on technology that may not be operable. Rather, simple paper-based charting will be required. Forms for patient records (including nursing notes and flow sheets), patient tracking and discharge planning should be prepared in advance; there should be an adequate supply of such forms, as well as clipboards and pens."
– Phillips and Knebel (eds.), p. 90.

The Internal Patient Transportation Unit (IPTU) will coordinate with the Patient Care Coordinator (PCC) and transfer patients to their assigned nursing subunits. Upon arrival at the nursing subunit, a physician will complete and customize each patient's standing admission orders based on his or her assessment.

Standard inpatient procedures will prevail but will follow a more streamlined and scaled down approach consistent with the limited care options available at the ACS. Medical clerical personnel in each nursing subunit will process the physician's standing orders, while the RN will verify implementation. Nurses will complete an admission assessment and initiate the plan of care for each patient.

[46] Ibid.
[47] See Appendix B for an example of such standing orders.

# OPERATIONS

## Plan of Care

A standardized plan of care should be developed in advance for each virus likely to be encountered. The following plan of care / agent matrix provides several suggested biological agent specific therapies:

**Bioterrorist Agents and Plan of Care Matrix** [48]

| Agent | Chemotherapy (Rx) | Chemoprophylaxis (Px) | Comments |
|---|---|---|---|
| Anthrax (weaponized/inhalation) | Ciprofloxacin 400 mg IV q 8–12 h<br><br>Doxycycline 200 mg IV, then 100 mg IV q 8–12 h<br><br>Penicillin 2 million units IV q 2 h | Ciprofloxacin 500 mg PO bid x 4 wk If unvaccinated, begin initial doses of vaccine (0, 2 wk, 4 wk)<br><br>Doxycycline 100 mg PO bid x 4 wk plus vaccination (0, 2 wk, 4 wk) | Potential alternates for Rx: gentamicin, erythromycin, and chloramphenicol<br><br>PCN for sensitive organisms only |
| Tularemia | Streptomycin 30 g/kg IM divided BID x 10–14 d<br><br>Gentamicin 3–5 mg/kg/d IV x 10–14 d | Doxycycline 100 mg PO bid x 14d<br><br>Tetracycline 500 mg PO QID x 14 d | |
| Venezuelan Equine Encephalitis | Supportive therapy: analgesics and anticonvulsants prn | | |
| Botulinum Toxin | DoD heptavalent equine despeciated antitoxin for serotypes A–G (IND): 1 vial (10 mL) IV<br><br>CDC trivalent equine antitoxin for serotypes A, B, E (licensed) | | Skin test for hypersensitivity before equine antitoxin administration |
| Staphylococcus Enterotoxin B | Ventilatory support for Inhalation Exposure | | |

In the event of an influenza pandemic, it is suggested that the ACS plan of care follow a supportive or palliative therapy, which may include the provision of IV fluids and limited medical intervention.

In all cases, plan of care options should be developed and carried out under the direct supervision of a physician.

[48] Skidmore, Appendix G.

## OPERATIONS
### Guidelines for Patient Discharge or Death

There must be a pre-established criteria used to guide patient transfer and discharge decisions in order to maximize the number of ACS beds available for additional admissions.

- It should be noted that the need for patient discharge procedures is largely dependent on the presenting virus. In the case of high lethality agents/pathogens, the ACS will likely administer palliative rather than curative care in which case very few if any patients are expected to survive to discharge status.

Where discharge is appropriate, case managers and social workers will assist in planning for at home assistance and care. This will include referrals to psychological services and human relief services as well as necessary follow-up. Patients should receive pre-printed agent-specific discharge instructions along with a starter pack of any agent-specific medicines they may still require.

The deceased will be transferred by the IPTU to the ACS temporary morgue, which is responsible for tagging the remains, processing the records, and securing any personal effects.

## OPERATIONS
### Pediatric Considerations

The treatment of children can cause special requirements or needs for a facility:

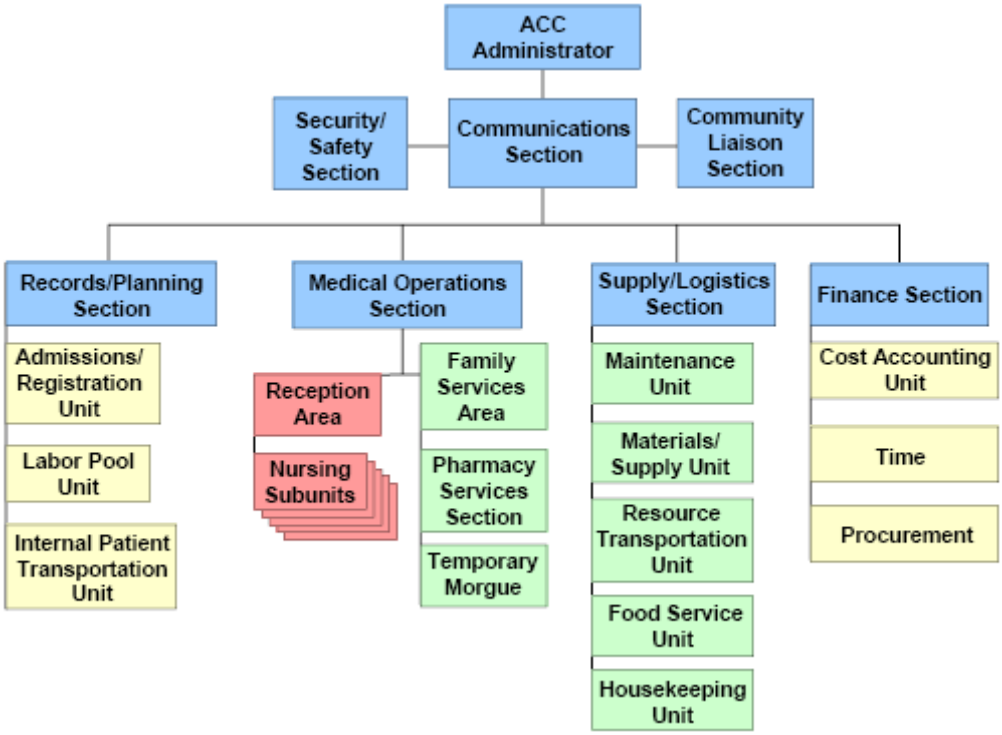
- Having adequate number of pediatric supplies.
- Having in place pediatric decontamination equipment and protocols.
- Having developed an effective response plan to manage large numbers of children.
- Having staff skilled at assessing young, non-verbal children.
- Taking care of children while wearing personal protective equipment.
- Creating systems for identifying, tracking, and reuniting children with their families.

## ORGANIZATION AND OPERATION
### Command and Control Structure

Every ACS plan must include a minimal number of stations and essential functions. However, while core functions should be incorporated into ACS site planning it is not essential in every case that every function also have a physical “station” at which the service function is delivered. Indeed, it has been found that if the balance of stations-to-open floor plan space is too far on either side, the efficiency of the facility can be compromised, slowing the flow of patients. It is therefore imperative to determine the absolutely necessary functions requiring their own physical station from those that do not – where staff performing the service function can “float” among the patients at the ACS providing services on a case by case basis. Even in these latter circumstances it is important to prepare areas where these floating staff can take clients out of the queue so that disruption in the flow is minimized.

The following ACS command and control structure was developed by the nationally recognized Incident Command System (ICS) and the Hospital Emergency Incident Command System (HEICS). Each section (both administrative and functional) under the ACS Administrator should have a director who is responsible for day to day management. This command and control structure offers a template for a locally determined ACS organizational structure that will fit into the existing local emergency command system. The type of agent used and resulting illness will determine the precise composition of the ACS.

**Acute Care Center/Alternate Care Site Command Organization** [49]




[49] Skidmore, p. 8.

# ACS ORGANIZATION AND OPERATION

## Management Level Descriptions

**ACS Administrator**

- Should be physically based in the Communications Section (CS)
- Responsible for the command and control functions of the entire ACS, including all of its sections and functional units
- Ensures the highest level of efficiency given constraints of staff and equipment
- Facilitates and manages communication flows into and out of the ACS
- Issues status/situation reports to Medical Command Center (MCC) or community's OEM that reflect real time patient and staff information

**Communications Section (CS)**

- Serves as the onsite communications and administrative hub of the ACS
- Maintains a log that documents all activities including operational problems, bed status, and staffing status
  - Ideally, the log will take the form of a pre-planned standardized electronic information system capable of supporting patient tracking, clinical management, and departmental administration. Pre-existing hospital information systems may be transferable to the ACS setting, but emergency planning officials must make this assessment in advance.
- In addition to providing an office location for the ACS Administrator, all ACS sectional directors as well as the Casualty Relocation Unit (CRU) will have a desk within CS in order to better coordinate actions and communication
- Must have sufficient space for computers.
  - Laptop computers offer greater mobility and their small size may be ideal if space is limited.
- Must have a dedicated telephone and communication system to receive and transmit MCC and supporting hospital requests. The ACS should also have one or more unlisted phone numbers available only to authorized emergency personnel.
- Data port and/or additional phone jacks are needed for fax machines or computer networking functions
- All ACS offices, staff workstations, administrative areas, and nursing subunits must have dedicated internal telephone lines directly connected to each other and the CS
- Mobile battery powered two way radios may be an effective means of communication and could provide a backup if other communication systems fail
- Mobile phones may provide a substitute for hardwired communications systems but networks may be overloaded or unavailable in an emergency
- In general, telephone communication systems should remain intact in the event of a bioterrorist attack. However, if the bioterrorist attack is accompanied simultaneously by an infrastructure attack, alternatives may become necessary.
  - If resources are limited, runners can be used to pass simple messages between workstations, sections, and external facilities.
- If available, a public address or intercom system can instantly relay announcements fit for public consumption. Some intercom systems may be able to select the location/s where the message will be heard in order to transmit more private communications.

- Ambulance services may require a Communications Base which provides a direct radio link with the CRU (Casualty Relocations Unit). The Communications Base should be located either within the CS or somewhere near it to avoid impacting the space if a high volume of ambulance traffic is likely.

**Security/Safety Section**

- The ACS must have 24/7 security
- The number of access points and the nature of the facility will determine the requirements for security staff
- All security personnel must wear identification badges which are clearly visible
- All ACS access points should be guarded by an adequate number of security personnel who must check the ID of anyone wishing to enter the facility
- Certain high-risk areas, such as the pharmaceutical dispensary, medical supply areas, family areas, and the temporary morgue, should have dedicated security personnel on guard at all times
- Local law enforcement will play a large role in the ACS security plan

**Best Practice:**
**Hurricane Katrina 2005**
It is always helpful to have real security personnel (off-duty hospital or mental hospital security staff would be ideal) who have previous experience dealing with patients but any uniformed person (such as ROTC cadets) 'makes patients and staff feel safe and keeps out troublemakers.'
– Phillips and Knebel (eds.), p. 90-92.

**Community Liaison Section**

- Composed of a community liaison director and one or more community liaison assistants
- While the ACS administrator establishes and maintains communication with the community's OEM, the community liaison director responds to community concerns that affect the ACS and its mission
- Responsible for media communications
- Acts as a point of contact for the community
- Coordinates public message with the hospital and NEHC

## ACS ORGANIZATION AND OPERATION

### Functional Unit Descriptions

**Records/Planning Section**

- Admissions/Registration
  - Staffs the admission/registration area with a patient care coordinator (PCC)
    - The function of the PCC is critical, similar to that of a nursing supervisor operating in a traditional hospital setting.
    - The PCC will be located in the Records/Planning Section but has support functions across the ACS.

        - The PCC maintains awareness of nursing staff and bed availability and directs patients to the nursing subunits accordingly.
    - Manages all paperwork generated in the ACS
    - Keeps track of all inpatients, including walk-ins who do not arrive from a hospital's ED or the NEHC.
    - Responsible for keeping patient status up to date
        - Patient registration
        - Patient treatment
        - Patient disposition
- Labor Pool
    - If staffing permits, a Labor Pool Unit Leader may be appointed
    - Responsible for keeping staffing status up to date
    - Maintains a staffing log which records the presence or absence of all available ACS personnel, including spontaneous volunteers
- Internal Patient Transportation
    - Transports patients from registration/admission area to their assigned nursing subunit bed.
    - Transports the deceased from their assigned nursing subunit bed to the temporary morgue
    - May also need to assist with bed/patient transport in other capacities due to unforeseen logistics

**Medical Operations Section**
Directed by a physician, the Medical Operations Section is responsible for all clinical areas of the ACS and every patient under its care. Responsible for maintaining strict infection control procedures and the overall sanitary condition of the ACS to protect staff, visitors, and patients.

- Nursing Subunits
    - The ACS is divided into 250 bed pods consisting of 5 nursing subunits containing 50 beds each. The number of 250 bed pods in an ACS will be predetermined by emergency planning personnel, though it must be stressed that building size and staff composition will be crucial limiting factors.

**Best Practices:**
**Nursing Subunit Setup Process**
To achieve maximum resource efficiency:

- The ACS can begin accepting admissions only after the first 50 bed nursing subunit is fully functional (including all core staff, equipment, and supplies).
- When the first nursing subunit reaches 70%-80% capacity patients should begin to be directed to the next nursing subunit until all 5 subunits of the 250 person pod are at 70%-80% capacity.
- After the 250 bed pod reaches 70%-80% capacity, admissions can distribute patients evenly across that pod until reaching full capacity.
- When the first 250 bed pod reaches 50%-60% capacity (just before the fifth and final nursing subunit of the first pod is opened), the second 250 bed pod should be nearing completion
- When the first subunit of the second 250 bed pod is finished, it can begin accepting patients.
- The process continues according to the same pattern until each 250 bed pod of the ACS reaches full capacity.
- The Medical Operations director controls the opening of all subunits and pods

– Skidmore, pp. 14-15.

-

- Pharmacy Services
  - Forecasts, orders, dispenses, stores, and maintains accountability of the pharmaceuticals needed to operate the ACS
- Family Services
  - Provides a separate area where families can go to relax.
  - Provides counseling services for patients, staff, and family members
    - Requires specialized counseling and social services staff
  - FS is a beneficial but non-vital ACS component
    - Emergency planning must decide whether to have a family services unit if resources and space permit
- Temporary Morgue
  - Records personal data of the deceased
  - Tags the remains
  - Inventories and secures personal effects
  - Arranges for transfer to mortuary facility
  - Temporarily stores remains until they can be sent to mortuary facility

**Supply/Logistics Section**
Responsible for all ACS services and support, including obtaining and maintaining the facility, equipment, and supplies.

- Maintenance
  - Procures, repairs, tracks, and maintains all equipment and the physical plant of the ACS
- Materials Supply
  - Forecasts, orders, stores, and maintains accountability of equipment and supplies necessary for ACS operation in coordination with Resource Transportation.
- Resource Transportation
  - Moves all supplies and equipment within the ACS
  - Delivers supplies from the external facility
- Food Service
  - Provides food for patients and staff

- May also provide food to visitors/family members if sufficient resources are available.
- Food preparation area must be separate from patient areas

- Housekeeping
  - Cleans and disinfects the ACS
    - May coordinate cleaning procedures with Medical Operations

### Finance Section

The creation of the Finance Section is at the discretion of the ACS Administrator if sufficient resources are available.

- Cost Accounting
  - To accurately account for the costs of running the ACS in order to prepare for later impact analysis and reimbursement

## STAFFING

### General Requirements

A staff consisting of physicians, nurses, respiratory therapists, non-licensed patient care providers (nursing assistants), medical clerical personnel, maintenance or facility technicians, and civilian volunteers is required to operate the ACS.

Precise numbers of each type of personnel will be dependent on the type of virus threat. The number of casualties expected to survive versus expire will dictate the allocation of medical staff. For example, a virus illness with a low fatality rate that results in a large number of patients requiring acute inpatient care might indicate a need for more registered nurses. Conversely, an attack with an extremely potent agent that has a high fatality rate might indicate a need for fewer registered nurses because the patients' condition would deteriorate quickly, resulting in death.[50]

The following table lists the recommended ACS staffing plans for three potential patient illness categories, as necessary given the nature of the virus.

**Minimum Staff Requirements per 12-Hour Shift for Each 50 Bed Nursing Subunit** [51]

| Class | Infectious | Non-infectious | Quarantine |
|---|---|---|---|
| Physician | 1 | 1 | 0 |
| Physician extender (PA/NP) | 1 | 1 | 0 |
| RNs or RNs/LPNs | 6 | 6 | 2 |
| Health technicians | 4 | 6 | 1 |
| Unit secretaries | 2 | 2 | 1 |
| Respiratory Therapist | 1 | 1 | 0 |
| Case Manager | 1 | 1 | 0 |
| Social Worker | 1 | 1 | 1 |

[50] Skidmore, p. 4.
[51] Adapted from *Modular Emergency Medical System: Concept of Operations for the Acute Care Center*, May 2003.

| | | | |
|---|---|---|---|
| Housekeepers | 2 | 2 | 1 |
| Lab Personnel | 1 | 1 | 0 |
| Medical Asst/Phlebotomy | 1 | 1 | 0 |
| Food Service | 2 | 2 | 2 |
| Chaplain/Pastoral | 1 | 1 | 1 |
| Day care/Pet care | 0 | 0 | 1 |
| Volunteers | 4 | 4 | 4 |
| Engineering/Maintenance | 0.25 | 0.25 | 0 |
| Biomed-to set up equipment | 0.25 | 0.25 | 0 |
| Security | 2 | 2 | 2 |
| Patient transporters | 2 | 2 | 0 |
| **Total Staff Required** | **32.5** | **34.5** | **16** |

While volunteers are a critical staff component to the ACS, they may not be willing to perform certain functions (colostomy care, diaper changes, etc.) and as such there must be a clear expectation set out from the beginning establishing exactly 'who is going to do what'.[52]

**While the above table provides general estimates and ratios for staff, it is recommended to provide more security and support-staff personnel than calculated above.**

# MEDICAL EQUIPMENT AND SUPPLIES

## Supply Cache Plans, Requirements, and Contingencies

Medical equipment and supplies must be predetermined and cached in advance as normal medical supply chains will likely be strained or nonfunctional during a public health emergency.[53] The cache should be stockpiled in a fixed location where it can be transported to the chosen ACS site when required.[54]

The *Rocky Mountain Regional Care Model for Bioterrorist Events* developed supply and equipment lists for three cache levels:

Level I – Hospital Augmentation Cache ($20,000)

- Bare minimum of supplies (cots, linens, masks, gowns, gloves, etc.)
- May be used to increase institutional capacity
- Does not include pharmaceuticals

Level II – Regional Alternative Care Site Cache ($100,000)

- More complete set of supplies restricted to long shelf life items
- Does not include pharmaceuticals

[52] Phillips and Knebel (eds.), p. 92.
[53] Phillips and Knebel (eds.), pp. 85-87.
[54] Cantrill, pp. 33-34.

Level III – Comprehensive Alternative Care Site List (Cost Unknown)

- Complete set of items needed for an ACS 50 bed nursing subunit
- Includes oxygen supplies
- Includes both long and short shelf life items
- Does not include pharmaceuticals

The Level III Comprehensive ACS Medical Cache is the only of the three which meets the full medical supply needs of a 50 bed nursing subunit (excluding pharmaceuticals). As such, it is highly recommended that the District seek to implement the Level III Comprehensive cache in developing the ACS concept of operations.

- It is important to recall that the ACS is not designed to provide a comprehensive standard of care. Even the Level III Comprehensive list (despite its name) is general and not virus specific. It was developed in order to provide a level of supply coverage commensurate to the standard of care to be expected of an ACS, not a hospital.

## MEDICAL EQUIPMENT AND SUPPLIES

### Comprehensive Level III Medical Cache Supply List

The Comprehensive Level III medical cache consists of four supply categories:

- Equipment
- Patient-related consumables
- Administrative consumables
- Oxygen/respiratory equipment

**Equipment Considerations for 50 Bed Nursing Subunit** [55]

| Equipment | Infectious | Non-Infectious | Quarantine |
|---|---|---|---|
| Beds/Cots (with extra) | 52 | 52 | 52 |
| Chairs correlation with staffing level | 12 | 12 | 4 |
| Desks correlation with staffing level | 6 | 6 | 2 |
| Fax Machine | 1 | 1 | ? |
| Housekeeping Cart with supplies | 1 | 1 | 1 |
| Internet email Access | 1 | 1 | 1 |
| IV Poles | 50 | 50 | 0 |
| Linens (sheets/pillows/pillow cases/hand towels/bath towels) | 100 | 100 | 100 |
| Patient Commodes | 4 | 4 | 1 |
| Pharmacy Carts | 2 | 2 | 1 |
| Privacy Dividers | 25 | 25 | 25 |
| Refrigerators (food/meds) | 3 | 3 | 1 |

[55] Adapted from *The Concept of Operations for the Acute Care Center*, the U.S. Army Soldier and Biological Chemical Command (SBCCOM), May 2003.

| | | | |
|---|---|---|---|
| Stretchers | 2 | 2 | 0 |
| Supply Carts | 3 | 3 | 1 |
| Telephones | 5 | 5 | 5 |
| Treatment Carts | 2 | 2 | 0 |
| Washing Machine | 1 | 1 | 1 |
| Wheelchairs | 2 | 2 | 1 |

**Patient-Related Consumables for 50 Bed Nursing Subunit**

| Item Description | Calculations of Quantities | Total Item Count | Unit of Issue | Total UoIs Required |
|---|---|---|---|---|
| Alcohol pads (multiple widespread use) | 2-4 Boxes per 24 hours | 14-28 | Box | 1 Box |
| Catheters, intraosseous module blue (pediatric use) | May use 1/day max. | 6-7/wk of 1 standard size | Each | 7 Each |
| Intermittent IV access device (lock) | 50 pts initially (first day) then 10% | 250/wk | 50/Box | 5 Boxes |
| IV catheters, 18g with protectocath guard | 40% of pts req IVs | 150/wk | 50/Box | 3 Boxes |
| IV catheters, 20g with protectocath guard | 40% of pts req IVs | 150/wk | 50/Box | 3 Boxes |
| IV catheters, 22g with protectocath guard | 10% of pts req IVs | 25/wk | 50/Box | 0.5 Boxes |
| IV catheters, 24g with protectocath guard | 10% of pts req | 25/wk | 50/Box | 0.5 Boxes |
| IV fluid bags, NS, 1000cc (required by 60% of patients) | (50% of pts(25)/day x 3L/pt)x | 315 L/wk | 12/Case | 18 Cases |
| IV fluid bags, D5 1/2NS, 1000cc (required by 40% of patients) | (50% of pts(25)/day x 3L/9t)x | 210 L/wk | 12/Case | 18 Cases |
| IV start kits | Same # as intermittent access device | 60 | 25/Box | 2.5 Boxes |
| IV tubing w/ Buretrol drip set for peds | 10% peds/wk | 25/wk | 20/Case | 1.25 Cases |
| IV tubing w/ standard macrodrip for adults | Same # as intermittent | 250/wk | 48/Case | 5 Cases |
| Needles, Butterfly, 23g | 10% peds/wk | 25/wk | 50/Box | 0.5 Boxes |
| Needles, Butterfly, 25g | 10% ped/wk | 25/wk | 50/Box | 0.5 Boxes |
| Needles, sterile 18g | 1 box/day | 7 boxes/wk | 100/Box | 7 Boxes |

| | | | | |
|---|---|---|---|---|
| Needles, sterile 21g | 1 box/day | 7 boxes/wk | 100/Box | 7 Boxes |
| Needles, sterile 25g | 1 box/day | 7 boxes/wk | 100/Box | 7 Boxes |
| Saline for injection 10cc bottle | 50 bottles/day | 350 bottles/wk | 24/Box | 14.5 Boxes |
| ABD bandage pads, sterile | 10% pf [ts/day = 5 pads/day+35 pads/wk | 7 boxes/wk | 50/Box | 7 Boxes |
| BandAids | 1 box/day | 7 boxes/wk | 50/Box | 7 Boxes |
| Basins, bath | 20 pts/day | 140/wk | 100/Case | 1.5 Cases |
| Bathing supply, prepackaged (e.g., Bath in a Bag™) | 50 pts every day | 350/wk | | 350 |
| Bedpans—regular | 40 pts/day initially then 10% | 65/wk | 50/Case | 1.25 Cases |
| Toilet Paper | 25 rolls/day | 175 rolls/wk | | 175 Rolls |
| Blankets | 50 pts/day; changed daily | 50/day or 350/wk | | 350/Week |
| Carafes—1 liter (for variety of uses) | 30/day | 210/wk | | 210/Week |
| Cart, supply | 3/unit (1 for IVs;1 for Pt.) | 3/unit | | |
| Chux protective pads (many uses) | 3/pt q3hrs = 24 chux/pt/day x 50 pts + 1200/day | 8400/wk | 50/Box | 168 Boxes |
| Cots (have extras available to replace broken equipment) | 50/unit plus 2 extra | 52/unit | | 52/Unit |
| Curtains, privacy (wheeled) | 25 (every other bed) | 25/unit | | 25/Unit |
| Diapers—adult | 10/day | 70/wk | 72/Case | 1 Case |
| Diapers—infant | 8/day/infant x 5 infants/day | 280/wk | 144/Case | 3 Cases |
| Diapers—pediatric | 5/day/ped x 5 peds/day = 25/day | 175/wk | 144/Case | 1.25 Cases |
| Emesis basins | 100/wk | 100/wk | 250/Case | 0.5 Case |
| Facial tissue, individual patient box | 1 box/pt/day | 350 boxes/wk | 200 Boxes | 1.75 Cases |
| Feeding tubes, pediatric—5 French | 10/wk | 10/wk | 10/Box | 1 Box |
| Feeding tubes, pediatric—8 French | 10/wk | 10/wk | 10/Box | 1 Box |

| | | | | |
|---|---|---|---|---|
| Foley Catheters—16F Kits (includes drainage bag) | >50% of pts wk | 100/wk | 10/Case | 10 Cases |
| Gloves non-sterile, small/medium/large (latex and non latex) | 6 boxes/day | 42 boxes/wk | 100/Box | 42 Boxes |
| Goggles/face shields, splash resistant, disposable | 6 boxes/day | 42 boxes/wk | 100/Box | 42 Boxes |
| Gown, splash resistant, disposable | 3/staff/shift = 36/day | 252/wk | Box | 42 Boxes |
| Mask, N95, for staff (particulate respirator) | 36/day | 252/wk | 210/Case | 1.2 Cases |
| Gown, patient | 75/day | 525/wk | | |
| Mask, 3M 1800 for patient | 150/day | 1050/wk | | |
| Gauze pads, non-sterile, 4x4 size, | 400/day | 2800/wk | | |
| Hand cleaner, waterless alcohol-based | 1 per handwash station/day x | 28/wk | 25 Bottles/Case | 1 Case |
| Paper Towels | 25 rolls/day | 175 rolls/wk | | 175 Rolls |
| Lubricant, Water soluble | | 1-2 boxes wk | 25 Boxes | 0.5 Boxes |
| Medicine cups, 30ml, plastic | 2/pt/day = 100/day | 700/wk | | 700/Week |
| Morgue Kits | Tularemia: 15pt/day mortality | 300/wk | | 300/Week |
| Nasogastric tubes—18F | | 25/wk | 50/Case | 0.5 Cases |
| OB Kits | | 1/wk | | 1/Week |
| Pen lights | | 12/unit | 6/Box | 2 Boxes |
| Povidone-iodine bottles, 12 oz | 2/day | 14/wk | 48 Bottles | 0.25 Cases |
| Restraints, Extremity, soft—adult | | 25/wk | 48/Case | 0.5 Cases |
| Sanitary pads (OB pads) | 2 women/wk; 10 pads/day | 20 pads/wk | 12 Pads | 2 Boxes |
| Sharps disposal containers—2 gallon | 2-4/wk/unit | 2-4/wk | 20/Case | 0.25 Cases |
| Sheets, disposable, paper, for stretchers & cots | 100/day | 700/wk | | 700/Week |
| Syringes, 10cc, luer lock | 4 boxes/wk (100 ct box) | 400 wk | 100/Box | 4 Boxes |

| | | | | |
|---|---|---|---|---|
| Syringes, 3cc, luer lock, w/ 21g 1.5" needle | 200/day | 1400/wk | 100/Box | 14 Boxes |
| Syringes, catheter tip 60cc | | 25/wk | 50/Box | 0.5 Boxes |
| Syringes, Insulin | 4/day | 28/wk | 100/Box | 0.25 Boxes |
| Syringes, TB | 2/day | 14/day | 100/Box | 0.4 Boxes |
| Tape, silk—1 inch | 12/day | 96/wk | 12 Rolls/Box | 8 Boxes |
| Tape, silk—2 inch | 6/day | 42/wk | 12 Bolls/Box | 3.5 Boxes |
| Toilet tissue | 25 rolls/day | 175 rolls/wk | | 175 Rolls |
| Tongue depressor | | 2 boxes/wk | 500/Box | 2 Boxes |
| Tubex™ pre-filled syringe holders | 1 per staff member plus | 12/sub-unit | 50/Case | 0.25 Cases |
| Urinals | | 50/wk | 50/Case | 1 Case |
| Washcloths, disposable | | 10/pt/day | 3500/Wk | 3500/Week |
| Water, bottled 1 liter (for mixing ORT) | 1/patient | 200/wk | | 200/Week |
| Water container, 1 gallon potable | | 125/wk | | 125/Week |
| Drinking cups | | | | |
| **Diagnostic Supplies** | | | | |
| Glucometer | | 1 per unit | Each | |
| Glucometer test strips | | 2 bottles/wk | 50 Strips/Viles | 2 Viles |
| Probe covers for thermometers | 4 boxes/day | 28 boxes/wk | 20/Box | 28 Boxes |
| Protocol unit (or other brand), 02 sat monitor, thermometer, BP, HR | | 4 per unit | Each | |
| Protocol unit, disposable plastic BP covers | 200/day | 1400/wk | | |
| Single Use Shielded Lancets | 25/day | 175/wk | | 1 Box |
| Stethoscopes | | 12/unit | Each | 12 |

**Administrative Consumables for 50 Bed Nursing Subunit**

| Item Description |
|---|
| Pens—Black ballpoint |
| Pens—Red ballpoint |
| Stapler |
| Staples |
| Tape |
| Tape dispenser |
| Paper clips |
| Paper punch (3- or 5-hole based on chart holders) |
| Chartholders/Clip boards |
| File Folders—letter size, variety of colors |
| Namebands for Identification and Allergies |
| Batteries—9V |
| Batteries—AA |
| Batteries—C |
| Batteries—D |
| Clipboards |
| Chalk or white boards |
| Dry-erase markers |
| Chalk |
| Trashcans and liners |
| Flashlights |
| Plastic bags for patient valuables |
| Floor lamps |
| Table lamps |
| Lightbulbs |
| Plain paper |
| Filing cabinets—rolling |
| Black permanent markers |
| Yellow highlighter markers |
| Time cards |
| Generic sign-in, sign-out forms |
| Pre-printed admission Order forms |
| Blank physician order forms |
| Multidisciplinary progress notes |
| Nursing flowsheets |
| Admission history & physical forms (include area for Nrsg Hx) |
| Death certificates/Death packets |

**Oxygen and Respiratory-Related Equipment Considerations for 50 Bed Nursing Subunit**

| Item Description | Quantity |
|---|---|
| Bag-Valve-Mask w/adult and peds masks—adult 1600 ml reservoir | 1 |
| Cascade gauge for oxygen cylinders | 14 |
| Catheters, suction | 20 |
| Connector, 5 in 1 | 8 |
| Cylinder holders for E Cylinder oxygen tanks | 4 |
| Mask, oxygen—nonrebreather, pediatric | 10 |
| Mask, oxygen—nonrebreather, adult | 20 |

| | |
|---|---|
| Nasal cannula, adult | 40 |
| Nasal cannula, pediatric | 10 |
| Regulator, Oxygen (Flow meter) | 14 |
| Suction unit—Collection System | 2 |
| Suction unit—Portable | 1 |
| Suction unit Battery | 1 |
| Tank, Oxygen "E" cylinder (700 L $O_2$) | 4 |
| Tank, Oxygen "H" cylinder (7000 L $O_2$) | 10 |
| Tubing, oxygen—with connector | 40 |
| Tubing—suction, connector | 10 |
| Tubing, suction, 10F | 10 |
| Wrench, Oxygen tank | 2 |
| Yankaur Suction Catheter | 10 |
| Intubation equipment with oral airways/ET tubes; adult & peds | 1 set |
| Ventilators | 1 |

# MEDICAL EQUIPMENT AND SUPPLIES

## Medical Supply Considerations

**Modular Caching**

As the above medical supply cache was developed for a standard 50 bed nursing subunit it is logistically useful for the physical cache to be stored according to following modular specifications:

- Five 50 bed nursing subunit caches should be stored in a single container to simplify transport to the ACS, which itself is divided into pods each containing five 50 bed nursing subunits.
- Each 50 bed nursing subunit cache should itself be stored in a separate container to facilitate breakdown and distribution to the nursing subunits once the full cache arrives

**Non-Cache Considerations**

The *Rocky Mountain Regional Care Model for Bioterrorist Events* study investigated the possibility of using an 18-wheel semi-trailer truck stocked with medical equipment and modified to serve as a stand alone highly mobile medical facility. This would have the potential of providing a higher level of care at an ACS, but was considered cost prohibitive at an estimated cost of $2.4 million per truck.[56]

Other rapidly deployable self contained medical units include:

- The Air Force Small Portable Aeromedical Rapid Response (SPEARR)

[56] Cantrill, p. 29.

- Expeditionary Medical Support (EMEDS) [57]

**A Note of Caution**
Mobile medical facilities 'can be a significant asset in an austere environment with essentially no infrastructure' but the facility must be truly self-sufficient with full wrap-around capabilities 'to avoid becoming part of the burden on the requesting community.' In the aftermath of Hurricane Katrina (2005) mobile medical units suffered from logistical challenges and 'proved to be less useful than originally planned.'[58]

## PHARMACEUTICALS

### Supply List

While pharmaceuticals are an essential component to the ACS mission, preparing a supply list of pharmaceuticals to be used in an ACS is challenging. Many pharmaceuticals have treatment specific indications, making it difficult to prepare a single list which is both comprehensive and flexible enough to address the wide range of agents/pathogens likely to be seen in a bioterrorist attack or pandemic.

Furthermore, patients arriving at an ACS are not all alike. Comorbidities may be apparent. Some drugs are more effective in certain situations than others. Faced with limited resources, the selection of which drugs will be available in an ACS should be determined by local emergency planning management. Ultimately, compromises will have to be made.

Ideally the ACS should be supplied with medicines relating to:

- Acute hemodynamic support
- Acute respiratory therapy
- Pain control and anxiolysis
- Antibiotic coverage
- Behavioral health
- Chronic disease management [59]

The following list of stock medications for each 50 bed nursing subunit has been developed by identifying the most likely presenting symptoms resulting from the most likely agents/pathogens. Therefore, this list is not virus specific. Additional consideration was given to each drug's flexibility in action, its treatment applications, and its use across all age populations. The precise quantities shown rely on an estimate of the percentage of patients in a 50 bed nursing subunit who might require that medication. In most cases, quantities are based on the maximum allowable daily adult dosage. Pediatric dosing is also provided where appropriate. All dosing is on an as-needed basis (PRN) except for antibiotics. The chart below assumes that each 50 bed nursing subunit will contain 80 percent adults and 20 percent pediatrics at full capacity.

[57] Ibid.
[58] Ibid.
[59] Phillips and Knebel (eds.), pp. 87-88.

**Supply of Pharmaceuticals Required for Each 50 Bed Nursing Subunit** [60]

| Drugs | % of pts requiring drug | 1 day | 1 week |
|---|---|---|---|
| **Antibiotic CDC push pack** | **100%** | **50 daily doses medication for all 50 patients** | **350 daily doses** |
| **Promethazine (Phenergan)**<br>Dosing: 12.5–25 mg q4–6hr (IV/IM/PR)<br>Maximum dose: 200 mg/day<br>Pediatrics: 0.25–0.5 mg/kg/dose q6h<br>25 mg/vial; 50 mg/suppository | **100%**<br><br>**60%** | **320 vials**<br>(8 vials/pt/day x 40 pts)<br><br>**40 suppositories**<br>(4 suppositories/day x 10 pts) | **2,240 vials**<br><br>**210 suppositories** |
| **Digoxin (Lanoxin)**<br>Maintenance dose: 0.25 mg/day<br>Loading dose: 1 mg/day divided QID (assume 1 pt requires loading dose & 4 pts require maintenance dose per day)<br>0.25 mg/tablet | **10%** | **8 tablets**<br>(1 loading dose of 4 tablets + 4 maintenance doses) | **56 tablets** |
| **Furosemide (Lasix)**<br>(Assume 4 pts/day require maintenance dose of 40 mg PO BID & 1 pt/day requires acute therapy of 100 mg IV BID)<br>40 mg tablets<br>100 mg/vial | **20%** | **8 tablets**<br><br>**2 vials** | **56 tablets**<br><br>**14 vials** |
| **Diphenhydramine (Benadryl)**<br>Dosing: 25–50 mg IV/IM/PO q6h<br><br>Pediatrics: 1 mg/kg IV/IM/PO q6h<br>50 mg/vial<br>12.5 mg/5 cc | **75%** | **80 vials**<br>(4 vials/pt/day x 20 pts)<br><br>**400 cc or 14 fluid ounces**<br>(80 cc/pt/day x 5 pts) | **560 vials**<br><br>**100 fluid ounces** |
| **Lorazepam (Ativan)**<br>Dosing: 2 mg IV/IM q6hr<br>Pediatrics: 0.05 mg/kg/dose q6h<br>2 mg/vial | **70%**<br>**75% for all** | **48 vials**<br>(4 vials/pt/day x 12 pts) | **336 vials** |
| **Nitroglycerin SL 0.4 mg**<br>Dosing: 1 tab SL q5 min | **10%** | **1 bottle** | **1 bottle** |
| **Insulin NPH & Reg**<br>Dosing: individualized | **6%** | **1 vial of NPH & Regular** | **1 vial of NPH & Regular** |

[60] Skidmore, Appendix F.

| | | | |
|---|---|---|---|
| (Assume 30 units/pt/day of NPH, 70/30 & Regular)<br>10 cc vials (100 units/cc) | | | |
| **Albuterol MDI** Dosing: 6 puffs QID with spacer<br>Nebulizer: 1 u dose QID<br>Multidose dispenser<br>Unit dose for nebulizer | **40%** | **12 MDI** | **12 MDI** |
| **Aspirin 325 mg**<br>Dosing: 325 mg/day for platelet inhibition (cardiac & TIA) | **10%** | **1 bottle** | **1 bottle** |
| **Morphine Sulfate**<br>Dosing (titrate to effect): 5 mg IV/IM/SC q4h (0.1 mg/kg in 2-4 mg increments)<br>Pediatrics: 0.1 mg/kg/dose<br>10 mg/vial | **50%** | **100 vials**<br>(4 mg or 10 mg)<br><br>(4 vials/pt/day x 25 pts) | **700 vials** |
| **IV Fluids**<br>Dosing: 4 liters/pt/day<br>Normal saline or D5W .45% NS<br>1 liter bags<br>Dump out half the IV bag for peds or use volutrols | **50%**<br>(assumes the other 50% would use oral rehydration therapy) | **100 liter bags**<br>**60 liters of NS**<br>**40 liters of D5W.45%** | **700 liter bags**<br>(Assume 60% of pts are given NS and 40% of pts are given D5W .45% NS; therefore, need 420 bags NS and 280 bags D5W .45% NS) |
| **Acetaminophen**<br>Dosing: 1 g q4h<br>Pediatric: 15 mg/kg q4h (elixir volume based on a 32 kg child)<br>500 mg/tablet<br>160 mg/5 cc | **100%** | **480 tablets**<br>(12 tablets/pt/day x 40 pts)<br><br>**60 ounces of elixir**<br>(3 oz/day x 20 pts) | **3,360 tablets**<br><br><br>**420 ounces of elixir** |
| **Spacers for Albuterol MDI**<br>1 per pt | **40%** | **12 spacers** | **84 spacers** |
| **Oral rehydration packets**<br>Oral rehydration therapy (ORT) is a primary mode of treatment for dehydration in mass casualty situations. One packet makes 1 liter | **50%** | **100 packets**<br>(4 liters/pt/day x 25 pts) | **700 packets** |

# PHARMACEUTICALS

## Obtaining a Pharmaceutical Supply

Obtaining a pharmaceutical supply is problematic from a number of standpoints. Pharmaceuticals (such as those seen in the above list) may be provided under the Strategic National Stockpile in which case their delivery to the ACS should be coordinated under the development of a comprehensive response plan such as MEMS. However, the District of Columbia should avoid any undue reliance on outside sources as Department of Defense guidelines indicate that 'communities should expect to be self-sufficient for up to 72 hours' following a bioterrorist attack or pandemic outbreak.[61]

Preparing an ACS pharmaceutical cache would appear to be an obvious solution but the caching of a dedicated supply of pharmaceuticals involves numerous logistical considerations such as refrigeration (pharmaceuticals have various temperature storage requirements), stock rotation (some pharmaceuticals expire more quickly than others), and legal controls. In the end, this may not be a feasible solution.

The District may wish to consider negotiating a supply agreement with pharmaceutical suppliers and local pharmacies in advance.

**Best Practices:**
**Obtaining a Local Pharmaceutical Supply**
"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 ACSs will be required. 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."
- Skidmore, pp. 23-24.

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

- Before use, pharmaceuticals should be inspected to ensure that the drugs have not surpassed their active shelf-life or have not been adversely affected by storage conditions (refrigerated storage accommodations may be required for certain medications).

[61] Skidmore, p. 23.

# THE COMMUNITY FOCUSED AMBULATORY CARE CLINIC CONOPS

## Introduction

The Community Focused Ambulatory care clinic acts as a Point of Distribution (POD) for mass vaccination / prophylaxis.

There are three approaches for providing mass vaccinations and mass prophylaxis: "Push", "Pull" and a "Combination of Push and Pull." In the "push" approach, vaccines and/or medicine are brought directly, possibly by postal workers with police escorts, to individuals, elderly care facilities or other populations in an affected community during circumstances when it may not be feasible or desirable for the populations in question to physically move to an external facility. In contrast, the "pull" approach requires the physical relocation/travel of populations to specially designated centers where they can receive medications or vaccinations. While it is likely that an outbreak response, whether on a large scale or a small one, will require some "Combination of Push and Pull" this report is largely focused on "pull" campaigns and is ignoring the "push" campaign model.

**Research**
There are several reports, policies and practices utilized in this synthesis of "best practice" activities outlined in this document. Braintree Solution Consulting reviewed plans and reports from national research institutes including the CDC, AHRQ, other academic centers in addition to reports from the States of Texas, Michigan, New York, New Jersey and North Carolina, among others, as well as reports from metropolitan centers such as New York City, Philadelphia, Los Angeles, Denver, Miami, San Francisco, Chicago, and other participants in the Cities Readiness Initiative (21 in all).

# Profile of The District of Columbia

## Resources: Calculated Capacity

HEPRA has tasked Braintree with the responsibility of calculating the optimal number of ACS/POD sites that HEPRA should activate in the case that a mass vaccination response is warranted. However the optimal number of ACS/POD sites relies on variables that characterize the targeted pathogen and therefore precludes a universal conclusion. Despite this lack of a universally applicable number of ACS sites, Braintree has calculated an optimal number of ACS/POD sites based on readily available models and some basic assumptions.

Dr. Jeffery Herrmann of the Institute for Systems Research at the University of Maryland and Kay Aaby of the Advanced Practice Center for Public Health Emergency Preparedness and Response of Montgomery County under the support of CDC and NACCHO led a team of researchers who developed a clinic generator software module that provides estimates for POD staffing and clinic capacity. Braintree Solution Consulting utilized this model to calculate an estimated minimum number of clinics that HEPRA would need to operate in order to vaccinate the resident population of DC, which from Table 1 is 572,000 people. Braintree simulated two clinics. The first simulation models a clinic that dispenses antibiotic packs (i.e., an anthrax response) and the second simulation models a clinic that dispenses vaccinations (i.e. a pandemic influenza or small pox response). The outputs of these models are illustrated in Figures 1 and 2, respectively.

**Figures 1 and 2** mirror the BERM high flow model presented in a report prepared for AHRQ; "Community-Based Mass Prophylaxis: A Planning Guide for Public Health Preparedness" [Hupert, 2004]. This model has five core stations. These stations are greeters/screeners, triage, medical evaluation, prophylaxis dispensing or vaccination. The greeters/screeners receive patients into the clinic and pass out forms that the patients will fill out as they are moving through the clinic. The triage station identifies patients with special needs or infected patients and moves these patients to the medical evaluation station. All other patients proceed to the dispensing/ vaccination station. Medical evaluation staff examines patients that were flagged as symptomatic and/or having special needs. Patients that are cleared by the medical evaluation staff are returned to the clinic flow and proceed to the dispensing /vaccination station. Patients that are not cleared are transported to an appropriate facility. After receiving an antibiotic pack or vaccination patients exit the clinic [Hupert, 2004]. This model is designed for rapid patient throughput cycles. New York City utilized this high flow model during an anthrax drill, Operation TriPOD, held May 22, 2002. TriPOD attained patient flow rates of 1,000 per hour [Hupert, 2004].

Braintree's clinic simulations are based on several assumptions and estimates based on best practices. Consistent with current traffic control best practices and research, both simulations assume that patient populations will gather at staging areas and be delivered by bus (50 people per bus) to the ACS/POD. Patient routing estimates (the percentage of patients that will move from one station to the next) for both simulations are indicated in figure 3. In Figure 1, Braintree assumed that in accordance with CDC "treatment window" guidelines for an anthrax response that the clinic would dispense antibiotic packs to the entire DC resident population within 48 hours (It is important to note that transmission of Anthrax from person to person is unlikely and thus the response is generally limited to patients who were in the vicinity of an Anthrax release. BSC used the entire DC resident population to provide an estimate of the number of clinics would be needed to treat this population). The model calculations assume ACS/PODs would operate 24 hours a day. Required throughput was estimated at approximately 500 patients per hour. While New York was able to process 1000 patients per hour during TriPOD, Braintree used 500 patients per hour in order to offer a conservative estimate that we believe would ensure that DC was prepared to accommodate the targeted population and account for the stresses placed on staff and patients during a crisis event that may effect optimal flow at each clinic. Based on this model DC would need to operate **20 clinics** with 2100 staff members per shift across all clinics. Assuming that each clinic would operate two twelve hour shifts, the total number of staff members needed using this model is 4200 each day.

**Figure 2** illustrates a Pandemic Influenza ACS/POD operating 18 hours per day for 4 days. The required throughput is estimated at approximately 400 patients per hour. This estimated throughput was derived using conservative estimates and actual flow times at the Philadelphia Department of Public Health influenza vaccination exercise held October 7, 2005 (which in three intensive hours provided roughly 1800 seasonal flu vaccines to elderly populations). Based on this model DC would need to operate **20 clinics**. This model estimates that 2180 staff members per shift across all clinics. Assuming that each clinic would operate two nine hour shifts, the total number of staff members needed using this model is 4360 each day.

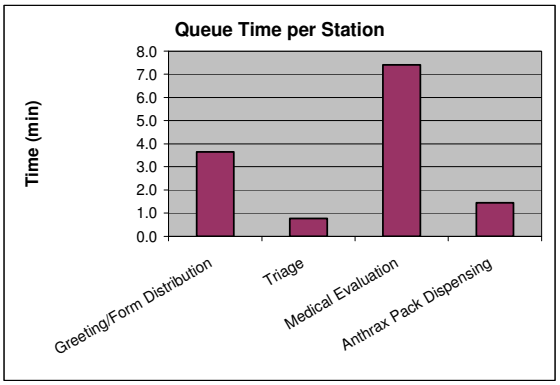
## Figure 1 Anthrax High Flow Model

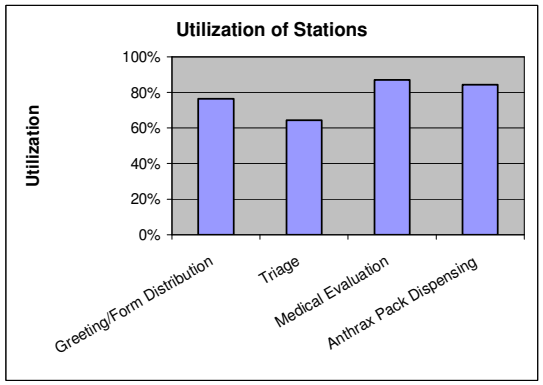
**Anthrax High Flow Model** ########

**Model created by Braintree Solution Consulting with Clinic Planning Model Generator 1.21**

| | | | |
|---|---|---|---|
| Size of population to be treated: | 572000 | Time in clinic (min): | 9.39 |
| Time allotted for treatment (days): | 2 | Average number of patients in clinic: | 93.21 |
| Daily hours of operation: | 24 | Bus interarrival time (min): | 5.03 |
| Number of clinic sites: | 20 | Clinic capacity (patients per hour): | 684.93 |
| Required throughput (patients per hour): | 596 | Total staff per shift across all clinics: | 2100 |

| Station | Staff | Utilization | Process Time (min) | Wait Time (min) | Cycle Time (min) | Queue Length | Required Queue Space (ft) | WIP |
|---|---|---|---|---|---|---|---|---|
| Greeting/Form Distribution | 15 | 76% | 1.15 | 3.64 | 4.80 | 23 | 68 | 48 |
| Triage | 4 | 64% | 0.26 | 0.77 | 1.03 | 8 | 23 | 10 |
| Medical Evaluation | 2 | 87% | 1.75 | 7.41 | 9.16 | 7 | 22 | 9 |
| Anthrax Pack Dispensing | 15 | 84% | 1.34 | 1.44 | 2.78 | 14 | 41 | 26 |
| **Total** | **36** | | | | | | | |



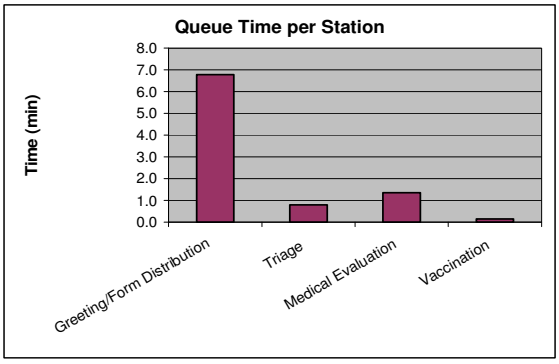
## Figure 2 Pandemic Influenza High Flow Model

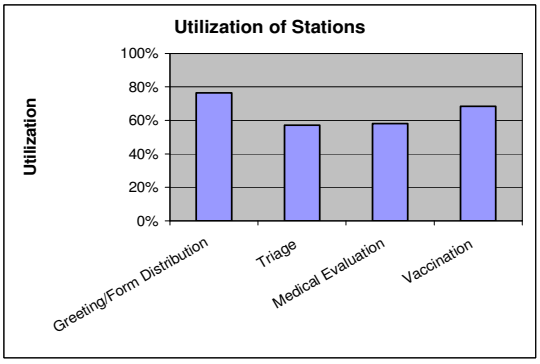
**Pandemic Influenza High Flow Model** ########

**Model created by Braintree Solution Consulting with Clinic Planning Model Generator 1.21**

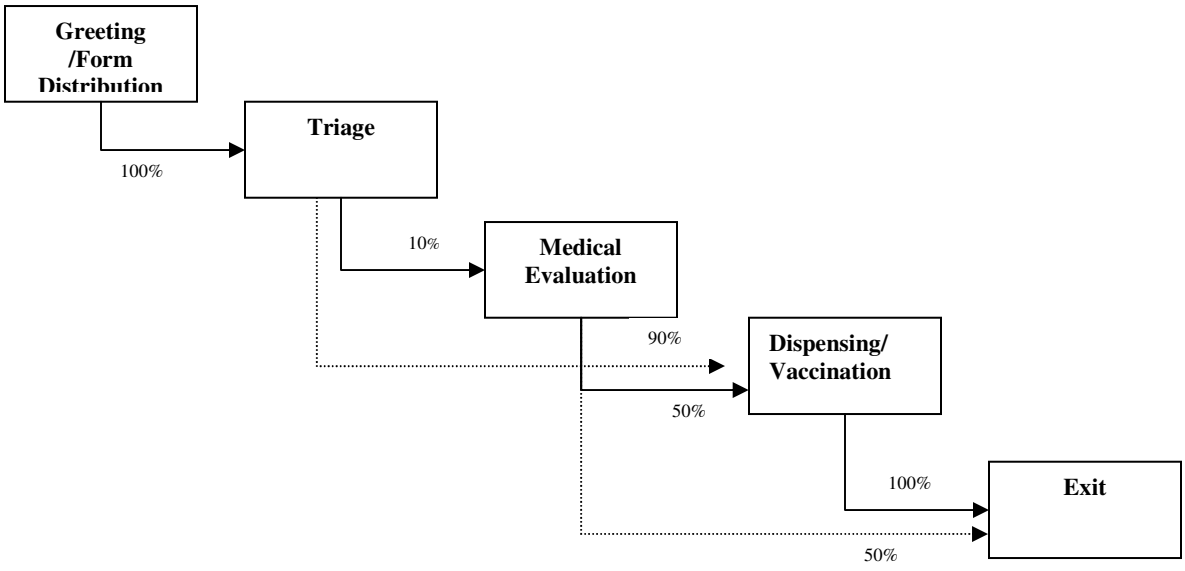
| | | | |
|---|---|---|---|
| Size of population to be treated: | 572000 | Time in clinic (min): | 12.55 |
| Time allotted for treatment (days): | 4 | Average number of patients in clinic: | 83.07 |
| Daily hours of operation: | 18 | Bus interarrival time (min): | 7.55 |
| Number of clinic sites: | 20 | Clinic capacity (patients per hour): | 519.93 |
| Required throughput (patients per hour): | 397 | Total staff per shift across all clinics: | 2180 |

| Station | Staff | Utilization | Process Time (min) | Wait Time (min) | Cycle Time (min) | Queue Length | Required Queue Space (ft) | WIP |
|---|---|---|---|---|---|---|---|---|
| Greeting/Form Distribution | 10 | 76% | 1.15 | 6.78 | 7.93 | 30 | 89 | 53 |
| Triage | 3 | 57% | 0.26 | 0.80 | 1.06 | 5 | 16 | 7 |
| Medical Evaluation | 2 | 58% | 1.75 | 1.36 | 3.11 | 1 | 3 | 2 |
| Vaccination | 30 | 68% | 3.26 | 0.16 | 3.42 | 1 | 3 | 21 |
| **Total** | **45** | | | | | | | |




## Figure 3 Patient Routing Estimates



Each of the estimates above in **Figures 1 & 2** provided a liberal estimate of 20 ACS/PODs across the District. As such, there would be room for 2 ACS/PODs in each Ward with an additional four ACS/PODs chosen at the discretion of public health planners. It is important to note that **the number and location of ACS/PODs utilized in a mass vaccination /prophylaxis campaign is secondary to the District's capacity of qualified staff**. In each model Braintree reviewed during this process the paramount goal of the simulation was not to determine the number of facilities but rather the number of staff. As noted in the following pages, there is a balance to be struck between the number of sites, the number of stations at each site, the number of staff manning each site, and the costs/benefits of taking the time and effort to transform a facility into an ACS/POD. Therefore, the calculations above, which assume 20 ACS/PODs across the District, likely overestimates the number of facilities required for a mass prophylaxis/vaccination campaign that involves the District's resident, a.k.a. "Nighttime," population. A campaign involving the District's daytime population would require roughly doubling the figures presented above.

## SITE SELECTION

### Facility Selection, Planning and Transformation

**Characteristics – "Making the most of what we have"**

As stated above in the overview of client population it is important to consider the number of people who will be vaccinated and the size and layout of the potential site. [CSB, 2003] These factors will have a direct impact on the patient-cycle time. For example, the more complicated the site layout and more restrictive the flow in hallways and between ACS/POD stations, the slower will be the rate of client flow through the facility. As such, optimal sites maintain a balance between the size of open spaces and the necessary hallways or queue partitions used to direct traffic flow and keep people in lines. Lessons learned from the San Francisco smallpox vaccination clinic exercise in June of 2003 emphasized the importance of clear signage and staff instructions, the referral of client questions to the briefing area or staff, the need to establish a flow control point outside of the facility, and the compounding problem long line queues can create if lines begin to co-mingle, causing confusion and the possibility of misdirected clients.

## SITE SELECTION

### Accessibility

Each site selection process begins with an assessment of the overall accessibility of the facility. This is most critical from a structural/architectural standpoint but also includes a measure of the familiarity and recognition the site might have within the District communities it is intended to serve during a vaccination effort. Some of the key characteristics of a potential ACS/POD location include:

- Familiar and accessible to the public [BIP, 2002]
- Accessibility to the facility from major street [CSB, 2003]
- Adequate parking and\or public transportation
- Accommodation available for special needs (e.g. wheelchairs) [BIP, 2002]

**Best Practices -** Henderson County, NC has operated an influenza vaccination clinic for priority populations over the past 20 years. Their design and operation has received accolades from NACCHO. To optimize clinic flow, Henderson County setup a separate room within the ACS to accommodate disabled populations. These clients register and receive the vaccination all in one place. This configuration helps control bottlenecks, maintains high flow volumes and provides efficient access to all populations

## SITE SELECTION

### Layout and Design

Layout and design characteristics of a proposed site play a prominent role in selecting an optimal site. First, the site must have adequate space to accommodate the selected populations. Second, security and safety issues must be considered. The list below highlights several crucial site characteristics that should be examined when assessing a potential ACS/POD site.

- Protected from weather; adequate climate control (heating and air conditioning)
- Adequate space for large crowds, intake, briefing screening, vaccine or prophylaxis administration, and medical emergencies.
- The space should have enough room to contain long lines inside, handle the target population with room to spare.

**Best Practices – Size is Relative:** The size of the dispensing site can vary; for example, one site identified in Tucson, Arizona, is 60,000 square feet, while a site identified in New York City is 18,000 square feet [DHHS, 2005].

- Security
  - Secure or can be made secure with adequate law enforcement personnel [BIP, 2002].
  - Should have outer and inner perimeter that can prevent wholesale movement of crowds into the dispensing area.
  - Inner perimeter should have only limited number of controlled entry and exit portals. [Hupert, 2004].

## SITE SELECTION

### Minimal Requirements

A mass vaccination campaign is the convergence of coordinated operations (delivery of SNS stockpiles, public safety), equipment (refrigerators, computers) human resources, and public services. Whether the ACS/POD is initiated in response to a crisis or as a scheduled event, each ACS/POD will become an operations center organizing this convergence at its site. In order to accommodate this convergence the facility must provide for the operation of equipment, service of the public, coordination with cooperating agencies and respite for the staff. While accessibility and layout are two important components to consider when performing a site assessment or selection decision, the minimal requirements of a proposed site include:

- Adequate power sources for equipment and hygiene for workers and public; access to water and electricity
- Storage for large amounts of supplies and bio-hazardous waste
- Refrigeration as indicated for storage of vaccine/prophylactic medication
- Adequate restrooms/space for portable restrooms if necessary
- Communication including telephone and fax
- Separate Administration Facilities (e.g. command center, break rooms)
- Rest Area for Staff/Food Preparation Area (may want to have located in separate areas.

## SITE SELECTION

### Types of Potential Sites

Potential sites for use as Dispensing/Vaccination Centers are virtually limitless but there are clearly facilities with characteristics that make them more or less preferable (efficient, effective, appropriate) than others. Below, a sample list highlights some of the commonly available facilities the District might convert into ACS/PODs during any type of vaccination/prophylaxis campaign. The immediately prior three sections above (Accessibility, Layout and Design, Minimal Requirements) provide a substantial amount of guidance regarding the thought process that goes into site selection and transformation but this document, and its referenced materials, should be reviewed in their entirety to more fully inform ACS/POD planners and staff.

The major types of institutions that can be considered for conversion to ACS/PODs include:

1. **Schools** – Schools have parking lots, long corridors, large classrooms, cafeterias, private offices, and other immediately available resources such as tables, chairs, restrooms, and offer an ideal physical structure that can meet most clinic needs [BIP, 2002].

   Positives
   - 1st Choice – high schools and middle schools (these schools tend to have a more desirable layout and ideal physical characteristics identified below)
   - 2nd Choice – primary schools tend to be more evenly dispersed [CDC, 2002].

   Drawbacks
   - In the case of a terrorist event, may have a school population present, which may complicate logistics (i.e. influx of parents or need to prevent contact)

2. **Enclosed Sports Arenas** [BIP, 2002]. Sites such as the MCI Center, the Washington Convention Center and the DC Armory are local examples of large-scale facilities readily convertible to an ACS/POD.

   Positives
   - Easily identifiable/well known to the public
   - Large gathering areas and a floor plan to accommodate high volume client traffic
   - Large parking areas – and metro accessibility
   - Ability to collect staff to one or two large locations

Drawbacks

- Security can be a challenge – to secure the entire site and all its areas
- In case of a riot or panic the problems would affect large numbers of people and a substantial portion of staff – the possibility of stampede-related deaths and injuries
- Lack education/briefing rooms distinct from main flow areas

3. **Local Employers** may offer site to vaccinate staff and family members [BIP, 2002].

4. **Churches** – and other faith-based organizations. Important to select only those facilities that have separate meeting areas and/or assembly halls separate from areas for worship.

   Positives

   - Easily identifiable/well known to the public
   - May have large gathering areas (event halls)

   Drawbacks

   - May not have an ideal layout, i.e. pews may obstruct ideal patient flow and organization of clinic
   - Lack education/briefing rooms
   - During a time of crisis this location may have a population for religious reasons that would be difficult to control/maintain the integrity of the clinic [Sally Phillips, 2005].
   - If a basement is used, limited entry and exit points (may be same) and not compliant with ADA

5. **Health Clinics** – these and other primary care providers will become locations for populations to go for their vaccinations/medications regardless of the instructions provided by the District and as such are a de-facto location that must brace and be prepared for a potentially substantial rate of visitation by the public. It is a policy decision during a mass vaccination campaign, therefore, on whether or not health clinics and hospitals are officially supported to serve as ACS/PODs. As a rule, this is undesirable due to the priority for these clinics and hospitals to fulfill the health functions they are designed to accommodate – and prevent large numbers of populations who do not require medical attention from crowding their parking lots and facilities simply by virtue of their preference for receiving their vaccination or medication from their primary care provider.

One option that may be utilized to avoid overwhelming health clinics/hospitals during a crisis is the deployment of security and staff at the clinics/hospitals around the District to ensure that only those with legitimate medical needs gain access to the parking lot and/or facility – and that those who can be accommodated by the ACS/POD are indeed diverted to them.

Positives

- Equipped to handle patients

Drawbacks

- During a time of crisis may need to focus on symptomatic patients diverted from ACS/PODs

## SITE SELECTION
### Special Considerations

Special Considerations for Mass Vaccination Clinics responding to a Localized Event (i.e. Smallpox or Anthrax)

- It is preferable if the site is close in geographical proximity to the outbreak
- Design should be sufficiently mobile and adaptable. May need to move entire operation to another site if the outbreak focal point changes. [CSB, 2003].

## SITE SELECTION
### Floor Plan Design and Layout

All ACS/POD sites are comprised of the same key components. These components may be exhibited as a station, a staff member, or a responsibility area. These universal components are listed below. It is important to note that most often the areas preferable for a mass vaccination clinic will be a school gymnasium or other large open space that can accommodate a large degree of flexibility for the ACS/POD floor plan customization.

- Transportation & Parking
- Greeters/Pre-Screening
- Form Distribution
- Triage
- Medical
- Briefing and Client Education
- Patient Care and Investigation
- Medical Screening/Drug Triage
- Medical Consultations
- Dispensing/Vaccination
- Form Collection and Exit

*See section on “Linear Flow” below for more detailed information and descriptions.

## SITE SELECTION
### Minimal Protocols

The operation protocols of an ACS/POD site will vary depending on the targeted agent. Hupert *et.al* have identified four categories of clinic operations whose operating protocols should be addressed at a minimum. These include:

- Triage
- Medical evaluation
- Pharmacotherapeutic evaluation
- Mental health and counseling [Hupert, 2004]

# STAFFING

## Overview

**Overview of Staff Functions and Roles**

Adequate levels of trained and qualified staff are essential to the implementation and operation of an ACS/POD for mass vaccination. These staff members will include medical professionals, public safety officers and community volunteers. Organizing staff members requires planning and coordination. The following section provides an overview of the staff required to optimize ACS/POD operations. The discussion of staff highlights general responsibilities and qualifications of these positions. It is important to note that the qualifications and responsibilities guidelines are provided in this section are a generalization of recommendation offered by several sources and should not be interpreted as a prescriptive formula for every vaccine dispensation ACS/POD. Qualifications and responsibilities will vary depending on the agent (Pandemic Flu, Smallpox, and Pertussis) that has triggered a mass vaccination response. Please consult the applicable Public Health and/or CDC guidelines when developing specific plans to address an agent.

Sources for this information came from several sources including but not limited to: CBMP, 2004; CDC, 2002; UMD, 2005

# STAFFING

## Core Staff

The term "core staff" refers to the staff members that perform the primary functions of the ACS/POD (i.e.; triage, vaccination, physical examination). The core staff is subdivided into four categories medical, psychiatric, pharmacotherapeutic, and non clinical.

**Medical**

The medical staff has three responsibilities. First, the medical staff serves as "front line" specialists evaluating potentially ill or infected patients and determining whether these patients may enter the clinic or need to be referred to a pre-determined facility for further evaluation. Second, once patients are inside the ACS/POD, the medical team provides additional evaluation and consultation for patients whose medical histories contraindicate vaccination or receipt of antibiotics (i.e. patients with immunodeficiency and women who are pregnant). Finally, this staff corps provides professional advice and care to patients who want or require additional attention after they have received vaccination.

| Staff Position | Mean Ratios | Qualifications | Responsibilities [CDC, 2002:3-10 – 3-11] |
|---|---|---|---|
| **Triage for Ill or Contact** | | Nurse or EMT | Direct ill patients to other evaluation facilities or care centers. Triage will direct identified contacts to a high-priority evaluation station within the clinic. |
| **Medical Screeners** | | Medical training required nurse or MD | Review patient history for those with contraindications and answer questions for informed consent. |

| | | | |
|---|---|---|---|
| **Physician Evaluators** | | Physicians to evaluate ill or more difficult medical history screening | Evaluate/examine triaged ill persons and provide backup counseling if needed to contacts and non-contacts identified with possible contraindications by medical screeners, and evaluate any immediate problems following vaccination |
| **Exit Review** | | Medical or public health personnel for final questions/instructions | Answer any final questions about vaccination or antibiotics, negative side-effects, and other issues following vaccination. |
| **Contact Evaluation** | | Public health – must be educated on contact surveillance process, smallpox signs/symptoms, and contact evaluation issues. | Provide separate medical screening, education, and registering of identified contacts and their household contacts. Procedures for treating contacts will vary depending on the agent. For example, smallpox contacts will also be registered for surveillance for smallpox symptoms and given instructions on any travel restrictions and reporting requirements. Please review CDC guidelines regarding isolation, quarantine or surveillance for the targeted agent. |
| **Transport/EMS** | | | Transport patients transferred from ill or contact triage to the appropriate facilities. Assist with medical emergencies. |

***For each of the above and the following staff positions it is important to consider the potential partners who can provide an adequate number of the qualified staff and volunteers to perform these roles.***

**Psychiatric**

Regardless of the reasons for establishing a vaccination clinic (i.e. a smallpox outbreak or a general vaccination clinic) a percentage of the population will experience psychological stress. It is recommended that each ACS/POD offer crisis counseling as needed.

| Staff Position | Mean Ratios | Qualifications | Responsibilities |
|---|---|---|---|
| **Crisis Counselors** | | Trained Crisis Counselor | Provide mental health counseling as needed |

**Pharmacotherapeutic**

The primary responsibility of this component of the core staff is the delivery of vaccine or antibiotic. The qualifications required for a member of this team depend on the type of prophylaxis being utilized and applicable state law. It is recommended that ACS/POD planning staff consult state law regarding qualifications when developing agent specific plans.

**Best Practices** – NYC recruited volunteers from local high schools to distribute anthrax prophylaxis packs during PODEX. PODEX was a mock Anthrax Mass Vaccination Clinic. Considering the manpower needed to successfully complete a prophylaxis campaign this tactic allowed emergency preparedness planners to deploy medical personnel to other sites. As Sally Phillips at AHRQ notes, "You do not need medical professionals to pass out pills."

| Staff Position | Mean Ratios | Qualifications | Responsibilities |
|---|---|---|---|
| **Vaccinators/Witness** | 1vs:1<br>*CDC recommends 2 vaccinators/witnesses at each station who can alternate throughout the shift [CDC, 2002] | Qualifications depend on the types of prophylaxis being administered and applicable state law. | Distribute or administer vaccination. Fill out vaccine card and sign as witness |
| **Vaccinator Assistant /Vaccine Preparation /Supply to VS Pharmacist** | 3pts/min:1* | CDC recommends a pharmacy tech or nurse experienced with vaccine or medication reconstitution [2002: 3-10]. However as with vaccinators qualifications depend on the types of prophylaxis being administered and applicable state law. | Prepare vaccine vials or antibiotic packs to supply vaccination stations |

**Non-Clinical**

The non-clinical corps of the core staff serves as the initial gatekeepers of the clinic. One of the primary roles of these staff members is directing ill or potentially infected patients to triage areas before these patients enter main areas of the clinic. There are no official guidelines for non-clinical core staff qualifications; however we recommend that these staff receive training with regards to the symptoms of the targeted agent. Forms distributors should have adequate training to quickly answer any questions related to the form. In addition, preparedness exercises have demonstrated that when these staff members are knowledgeable about the flow and procedures within the clinic they are able to alleviate the anxiety of many patients and control potentially disruptive situations within the clinic.

| Staff Position | Mean Ratios | Qualifications | Responsibilities |
|---|---|---|---|
| **Greeters/Screeners** | | The greeting function is not technical but personnel chosen to fulfill this role would ideally have strong voices and an authoritative presence. | Direct flow towards the clinic entrance. The greeters/screeners are the first "gate-keepers" |
| **Forms Distribution** | | Nonmedical volunteers | Distribute forms to patients and answer general questions |

# STAFFING

## Support Staff

**Core Support Staff**

The core support staff is the backbone of the ACS/POD. As the name indicates, without these team members, the core staff could not operate at optimal patient through put levels. While utilization of each staff position listed in the section above depends on the agent targeted by the ACS/POD operations it is recommended that all staff positions (responsibilities or positions could be combined at various stations) listed in this section be incorporated in any ACS/POD plan. The following section highlights the staff positions of this ACS/POD unit.

| Staff Position | Mean Ratios | Qualifications | Responsibilities |
|---|---|---|---|
| **Audio/Visual Technician (Run Orientation Video)** | 1 room:1+ (CDC recommends additional float staff for the education rooms – e.g. five running rooms and three floating between rooms to assist [2002:3-9]) | Nonmedical volunteers. | Organize educational materials and displays. Operate A/V equipment for applicable educational tools. |
| **Referral Personnel** | | Nonmedical volunteers | Examine medical screening/vaccination consent forms and direct patients to the appropriate stations depending on their responses to the medical screening/vaccination consent forms |
| **Translator (not counted in total clinic staffing estimates)** | | Language fluency with training. DC officially recognizes five languages (English, Spanish, Chinese, Vietnamese and Korean). In the event of a bioterrorist event it is recommended that translation services for German, Dutch, French, Portuguese, Greek and Italian also be provided. | Provide translation as necessary. |
| **Medical Records/Data Entry** | 2pts/min:1* | Nonmedical | Data entry for information collected on vaccines |
| **Line Staff** | | Nonmedical volunteers who would ideally have strong voices and an authoritative presence – and be fairly tall. | Assist with forms completion collection and clinic flow |
| **Clinic Manager** | | Existing Vaccine Programs Personnel | Oversee Clinic Operations. Serve as a problem solver |
| **Station Manager** | 3 stations:1* | | |

| | | | |
|---|---|---|---|
| **Supply Manager** | | Nonmedical | Oversee all supply needs. Track vaccine supply, distribution and wastage. Re-supply stations and clinic |
| **EMT** | 50 core staff:1* | Medical | Assist with medical emergencies |
| **IT Support** | 4 personnel:1* | Nonmedical | Provide support for computer, programming, electronic equipment maintenance needs and other information technology needs |

**Facility Support Staff**

Similar to the core support staff, the facility support staff provides invaluable services to the operation of the ACS/POD. It is particularly important to point out the role of the security staff. ASTHO points out that"[A contagious agent] erodes social cohesiveness because the source of your danger is your fellow human beings; the source of your danger is your wife, children, parents" [2002:10]. CDC highlights several core functions of the security staff. These are "ensure an orderly flow of traffic and parking at the clinic site ; assist in maintaining orderly movement of vaccine recipients through the clinic process; provide necessary control if persons become unruly; assist supply officer in maintaining security of vaccine and other supplies." The clinic manager should work closely with the security staff manager to coordinate a comprehensive security plan. For example, providing the security staff with a complete and accurate list of all personnel working at the clinic will allow the security staff to provide better security to the building. Finally, the float staff are general staff members that have been cross trained to fill-in where needed. However these staff may be utilized as runners. Exercises in San Francisco and Philadelphia have demonstrated that runners serve as effective communication tools to relay clinic conditions such as bottlenecks, low supplies or underutilized stations to the appropriate managers.

**Best Practices** – Clearly identifying runners through the use of brightly colored vests enables them to move quickly through the crowd. [Philadelphia flu vaccine clinic 10-7-05]

| Staff Position | Mean Ratios | Qualifications | Responsibilities |
|---|---|---|---|
| Security | 4 core staff:1* | Non-public health resource | Security details discussed above |
| Traffic Flow | | Non-medical assist with loading and unloading buses at site if offsite parking utilized | |
| Float Staff | | Nonmedical volunteers | Serve where needed |

*Mean ratios from [Hupert, 2004]. Braintree is gathering information to assist with the staff and equipment ratios below. Currently, there is no one agreed upon framework for the ratios of staff and equipment for ACS/PODs.

**Best Practices – Volunteers:** Henderson County, NC has partnered with the Henderson County Sheriffs Department to ensure that clinics will have adequate staff levels. The Sheriffs Department has developed a volunteer corps from the local community. The volunteer corps provides on-going support services for the Henderson County Sheriff.

# MEDICAL EQUIPMENT AND SUPPLIES

## Overview

**Overview of Equipment Needs**

The equipment needs are subdivided into two categories; equipment (capital or reusable equipment) and supplies (disposable equipment that requires restocking during and after a clinic). The following matrices are a comprehensive but not exclusive list of the equipment and supplies needed for the operation of an ACS/POD. In addition these matrices do not include the specific vaccination and or antibiotic supplies that will be delivered from the SNS. This list has been compiled predominantly from the CDC and the Texas Bureau of Immunization and Pharmacy Support (BIP) but is not a prescriptive list and should be reviewed and revised to suit the needs of the targeted population and agent.

The "Mean Ratios" column below is intended to provide a means for calculating the equipment needs of an ACS/POD in a manner aligned with the scale/size of the ACS/POD and its operations. Examples of mean ratio factors include, but are not limited to:

- Equipment item # needed per desk station
- Equipment item # needed per client (or to total clients)
- Equipment item # needed per relevant staff position

The "Quantity" column below is intended to provide ACS/POD setup and supply staff with a checklist and appropriate quantity for the specific ACS/POD they are equipping. Using the mean ratios to aid in calculations, this form can be printed and disseminated to staff in real time, allowing them to compile a list of existing equipment at the site and the equipment which may have to be transported to the location.

Sources for equipment and supply matrices include Braintree staff, Philadelphia Dept. Health; Texas Department of Health Bureau of Immunization and Pharmacy Support and CDC.

| EQUIPMENT (CAPITAL EQUIPMENT) | | | |
|---|---|---|---|
| ✓ | **Type** | **Mean Ratios** | **Quantity** |
| **General Supplies and Equipment** | | | |
| | 5 or more large screen video setups with VCRs or DVD players to show Orientation video | | |
| | 7 Orientation videos (allows for extra if video damaged) | | |
| | Cell phones | | |
| | Chairs – for staff and elderly or disabled patients | | |
| | Clipboards | | |
| | Extra plug-in telephone | | |
| | FAX machine | | |
| | File boxes | | |
| | ID badges for staff | | |

| | | | |
|---|---|---|---|
| | List of emergency phone numbers | | |
| | Pagers | | |
| | Photocopy machine | | |
| | Portable restrooms | | |
| | Sound Barriers | | |
| | Sound System | | |
| | Stools (Preferably tall bar type stools) | | |
| | Tables | | |
| | Telephones | | |
| | Toys, stickers, children's books; small TV with VCR and children's tapes | | |
| | Two-way radios | | |
| | Tow Truck | | |
| **Seasonal Equipment – The following equipment is optional based on the season and weather conditions** | | | |
| | Coat Racks (Winter) | | |
| | Fans (Preferably large standing fans) | | |
| | Heating Units (Portable heating units for winter) | | |
| **Vaccine Administration Supplies** | | | |
| | Hand Truck | | |
| | Pill-counting machines and/or trays (if needed) | | |
| | Screens (for changing, counseling, or administration, as needed) | | |
| | Small two tiered cart for moving supplies | | |
| | Smallpox vaccine Cooler/ refrigerator for vaccine | | |
| | Spatulas | | |
| **Crowd Management and Triage Supplies** | | | |
| | Queue partitions (to keep people in lines) - Yellow Caution Tape | | |
| | Colored Hand Paddles – with long extensions | | |
| **Signs** | | | |
| | *External - entrances and exits | | |
| | *Internal - Clearly marked areas, lines, stations | | |
| | *Biohazard | | |

| | | | |
|---|---|---|---|
| | *TDH contraindications posters, other posters specific to vaccine/prophylactic medication | | |
| **Emergency Supplies** | | | |
| | "Code" kit with defibrillator | | |
| | Blankets | | |
| | Cots | | |
| | Gurney | | |
| | Oxygen tank with tubing | | |
| | Pillows | | |
| **Computer Equipment and Supplies** | | | |
| | Computers | | |
| | Internet access for forms or database entry | | |
| | Printers | | |

**Supply Needs**
The "Mean Ratios" column below is intended to provide a means for calculating the supply needs of an ACS/POD in a manner aligned with the scale/size of the ACS/POD equipment and operations. Examples of mean ratio factors include, but are not limited to:

- Supply item # needed per desk station
- Supply item # needed per client (or to total clients)
- Supply item # needed per relevant staff position

The "Quantity" column below is intended to provide ACS/POD setup and supply staff with a checklist and appropriate quantity for the specific ACS/POD they are supplying. Using the mean ratios to aid in calculations, this form can be printed and disseminated to staff in real time, allowing them to compile a list of supply quantities needed at the site.
Sources for equipment and supply matrices include Braintree staff, Philadelphia Dept. Health; Texas Department of Health Bureau of Immunization and Pharmacy Support and CDC.

| **SUPPLIES (CONSUMABLES)** | | | |
|---|---|---|---|
| ✓ | **Type** | **Mean Ratios** | **Quantity** |
| **General Supplies and Equipment** | | | |
| | Calendars | | |
| | Cleaning supplies (mop, bucket, etc.) | | |
| | Date Stamps | | |
| | Envelopes | | |
| | Garbage containers and trash bags | | |

| | | | |
|---|---|---|---|
| | Kleenex tissues | | |
| | Paper | | |
| | Paper towels | | |
| | Pens, pencils | | |
| | Post-it Notes | | |
| | Rubber bands | | |
| | Scissors | | |
| | Snacks | | |
| | Stapler/staples | | |
| | Table pads and clean paper to cover table for work site | | |
| | Tape | | |
| | Water and cups | | |
| **FORMS** | | | |
| | Informed Consent Forms | | |
| | Public Information materials in English, Spanish and other languages | | |
| | Screening questionnaires | | |
| | Clinic vaccination administration record | | |
| | Reminder/recall/vaccine "take cards for clients - specific to Vaccine/Prophylactic Medication being administered | | |
| **Vaccine Administration Supplies** | | | |
| | “Sharps” containers | | |
| | Acetaminophen adult tablets | | |
| | Acetaminophen children's chewable (80mg) | | |
| | Acetaminophen drops samples | | |
| | Acetaminophen elixir samples | | |
| | Acetone | | |
| | Adhesive tape | | |
| | Antibacterial hand washing solutions | | |
| | Biological Waste Containers (i.e. 12 gallon size) | | |
| | Box Cutters | | |
| | Cloth Towels | | |
| | Gauze | | |
| | Labels | | |
| | Latex gloves | | |

| | | | |
|---|---|---|---|
| | Latex-free gloves | | |
| | Paper Gowns (for patients wearing clothes that do not give ready access to arm) | | |
| | Paper towels | | |
| | Pill Bottles and Lids | | |
| | Rectangle Band-aids | | |
| | Reusable ice packs (3-5 per station) | | |
| | Spot Band-aids | | |
| | Spray bottle of bleach solution | | |
| | Sterilized bifurcated needles | | |
| | Vaccine diluent | | |
| | Vaccine/Drug Information Statements | | |
| **Crowd Management and Triage Supplies** | | | |
| | Queue partitions (to keep people in lines) - Yellow Caution Tape | | |
| | Colored Tape (Electrical Tape) | | |
| **Emergency Supplies** | | | |
| | .9% Sodium Chloride | | |
| | 1.5” needles | | |
| | 3cc syringes with 1”, 25-gauge needles | | |
| | 5% Dextrose | | |
| | Adult and Pediatric airways | | |
| | Adult and Pediatric pocket masks with one-way valve | | |
| | Alcohol wipes | | |
| | Ampules of diphenhydramine 50mg IM | | |
| | Ampules of epinephrine 1:1000 SQ or EPI pen | | |
| | Aspirin, Tylenol, insulin, D50 | | |
| | Asthma Inhaler | | |
| | Blood Pressure Cuffs (various sizes) | | |
| | Emesis basin | | |
| | ER Report Form | | |
| | Flashlight and Extra Batteries | | |
| | IV Solution and tubing | | |
| | Oral Thermometer | | |
| | Probe covers for thermometers | | |
| | Rectal Thermometer | | |

| | | | |
|---|---|---|---|
| | Spirit of Ammonia | | |
| | Standing orders for emergencies | | |
| | Stethoscope | | |
| | Tongue depressors | | |
| | Tourniquet | | |
| | Tuberculin syringes with 5/8" needles (for epinephrine) | | |
| **Computer Equipment and Supplies** | | | |
| | Paper | | |

# LINEAR FLOW OF POPULATIONS AND DESIGN

## Defining Client Navigation and Experience

Every vaccine dispensation ACS/POD plan must include a minimal number of stations and essential functions. However, while core functions such as client education should be incorporated into ACS/POD site planning it is not essential in every case that every function also have a physical "station" at which the service function is delivered. Indeed, as stated above, it has been found that if the balance of stations-to-open floor plan space is too far on either side, the efficiency of the facility can be compromised, slowing the rate of vaccination. For each scenario (event), ACS/POD site, and intended rate of vaccinations, it is therefore imperative to determine the absolutely necessary functions requiring their own physical station from those that do not – where staff performing the service function can "float" among the clients at the ACS/POD providing services on a case by case basis. Even in these latter circumstances it is important to prepare areas where these floating staff can take clients out of the queue so that disruption in the flow is minimized.

As listed, there are a total of four core essential stations (triage, medical evaluation, dispensing/vaccination, and form collection and exit). An optimal flow facility, that is one in which a rapid rate of flow is the paramount goal of the ACS/POD, should plan for the functions listed in light of the stations realistically feasible for the flow required. In other words, a scenario in which a crush of public demand and/or a lack of adequate ACS/POD-site size necessitates a prioritization of high flow at the expense of more thorough ACS/POD activities. In these circumstances the floor plan and intended flow rate often requires that certain functions be performed by "floating staff" as opposed to staff assigned to a particular station location set up for performing that function or service. In these latter cases, the functions that, while important, do not fundamentally require a physical location are referred to as "station or function." These issues are revealed in greater detail in each of the sections below.

# FACILITY AND FLOOR PLAN DESIGN

## Transportation and Parking

The key issue here is "Accessibility" to and easy exit from the ACS/POD for all staff, supplies, support lines, and client populations. Poor planning and implementation in this area can cause all

ACS/POD activities to come to a halt. Every vaccine dispensation ACS/POD and Staging Area (see below) should have the capacity to transport casualties and patients with acute illnesses or adverse reactions to the medications/vaccinations administered at the ACS/POD. This is the first area of concern and, together with other variables for the efficient operation of the mass vaccination/prophylaxis effort, requires a review of the nature and type of activities conducted:

- **Transportation for ACS/POD staff** – especially EMS staff and the parking of their vehicles/ambulances

- **Transportation for ACS/POD supplies and equipment** (stockpile re-supply is paramount concern – the loading and unloading areas and through-fare for the supply trucks)

- **Transportation for Clients/Patients** (all types of populations requiring access to the facility including the physically handicapped). Three methods for client transportation to facility:
    1. Self-Delivery to ACS/POD either on foot or by car, bike or bus
    2. Staging Areas (sometimes called "pre-PODs") – predetermined locations where clients board buses and shuttles that then take them to the ACS/POD. This approach is highly attractive for providing greeting and pre-screening (see below) services that can speed the flow of their processing once they reach the ACS/POD (they fill out forms en route to facility and those requiring immediate medical attention can get it). Staging areas are also useful for regulating the flow of people arriving at the ACS/POD site, reducing the effects of bottlenecks in client flow.

**Best Practices** – "During the DC Postal Anthrax Incident in 2001, postal workers were taken by bus to DC General Hospital from their worksite at the start/end of their shifts. This practice minimized parking and traffic difficulties" [DHS, 2005].

    3. "Active Pull" – situations in which buses/vans pick up homebound, disabled or other special needs populations at their homes or other locations and bring them to the ACS/POD

**Parking**

It is essential that streets and entranceways be cleared and uncongested so that traffic flow remains efficient and people and supplies can move to and from the facility without significant delay. As a precaution, it may be desirable in some locations to have a tow truck assigned to the facility or at least in close proximity to several ACS/PODs in a region or Ward of the city.

## FACILITY AND FLOOR PLAN DESIGN

### Greeters / Pre-Screening

Greeters and/or those conducting pre-screening activities are responsible for controlling the intake flow of people into the ACS/POD as well as working to identify those arriving at the facility (or staging area) who are ill and require immediate medical evaluation/attention. These screeners also help identify those who might have been at higher risk of exposure and possibly assist FBI or public health officials in conducting investigations and/or forensic activities. These

greeters can distribute and review forms, thereby directing clients to the most appropriate station or staff. In short, these staff members function as the gatekeepers for the facility and represent the key control mechanism for regulating the flow into the ACS/POD.

## FACILITY AND FLOOR PLAN DESIGN

### Form Distribution

In many cases it will be desirable for some type of data collection from clients to be used for guiding them to the appropriate stations/services and for also enabling future follow-up after they exit the ACS/POD. In these cases, clients should receive forms and instructions on how to fill them out. It is important to refer client questions to the Briefing and Client Education (below) station or staff in order to keep flow rate high and avoid bottlenecking. Of course, in a mass vaccination/dispensing activity requiring the fastest possible rate of processing, it is likely to be preferable to drop the collection of patient forms and move to more streamlined measures.

## FACILITY AND FLOOR PLAN DESIGN

### Triage

Triage is an essential function requiring its own physical space – station – within or near the entry of the ACS/POD. The core purpose is to determine the appropriate protocol for the client's entry into or redirection from the ACS/POD. Patients identified as showing potential symptoms receive a quick examination to determine the appropriate course of action – be it a return to the main client path for vaccine/medication or to appropriate treatment. Those showing illness are referred to Medical Evaluation (below). Those moving on in the main client path go to briefing rooms or receive access to some measure of client education (depending on whether education has its own station or is simply an imbedded service in triage).

## FACILITY AND FLOOR PLAN DESIGN

### Medical Evaluation

This essential station is a location in the ACS/POD where ill clients can have a more thorough examination and a consultation with an expert to determine whether and how they should be treated, move on to potential quarantine, be allowed to re-enter the ACS/POD flow, receive transportation assistance to a medical facility and/or participate in an investigation (FBI or public health forensics). In some cases clients will move on to Patient Care Stations (see below) if they are available.

## FACILITY AND FLOOR PLAN DESIGN

### Briefing and Client Education

There are three basic methods for educating clients. The first and most efficient are classroom-based stations in which clients are shown educational videos to enable informed consent and self-informed decisions on the part of the client. In these approaches it is critical to have adequate AV equipment and high-quality videos for both audio and video clarity. There will be a fair amount of noise and activity in the classrooms. A trained staff person should monitor the performance of

the AV equipment and be available to answer impromptu client questions and concerns. It is ideal if this staff person is also capable of responding to health questions and is familiar with all general aspects of the ACS/POD operations and clinical issues. If classroom education is needed, the capacity of the room(s) are a critical variable in determining the net rate of flow through the ACS/POD. These classrooms can act like a toll booth on the highway, bringing traffic to a halt. It is essential that there be an adequate capacity among the classrooms to ensure a steady, regulated or staggered flow of clients.

A second type of client education is a passive education format. Generally this is handled through either information sheets handed to patients as they enter the ACS/POD or through informational signs located at key points within the clinic.

**Best Practice – Education:** Henderson County has used informational signs in the queue areas to inform patients about the flu vaccination as well as other health topics specific to the targeted population.

Finally, education can be delivered on a one-to-one basis either through staff that "float" such as the AV monitor above or by separate stations equipped with staff assisting clients that need additional information or clarifications.

*NOTE: Briefings can occur prior to Triage depending upon the scenario.

**Best Practices – Mass Education?** Researchers at the University of Maryland's Institute for system research and the Montgomery County Department of Public Health Services have concluded that using auditoriums to educate large groups (250 patients) prior to vaccination actually increases the average time-in-clinic for a patient by over 40 minutes. The use of small classrooms that accommodate approximately 30 patients is the optimal way to process patients through the education station and maintain high patient flows [Aaby *et.al,* 2005].

## FACILITY AND FLOOR PLAN DESIGN

### Patient Care and Investigation

There are four types of Patient Care functions and each can have its own physical station at an ACS/POD.

1. Mental Health and Counseling/Education
2. Sick Bay
3. Patient Forensics and Investigation (medical/criminal investigation by a health department or FBI)
4. Pregnant Station

## FACILITY AND FLOOR PLAN DESIGN

### Medical Screening / Drug Triage

A location or function whereby client forms are examined to ensure they can safely receive the treatment prescribed and/or referral to a physician if complications from the medication are experienced.

**Best Practices – Colored Paddles:** San Francisco noted in the after action report to a smallpox vaccination clinic exercise held June 17, 2003 that bottlenecks occurred in the lines leading to this station. The primary cause of these bottlenecks was that line staff and patients could not see when a medical screener was available. The recommended solution was the use of colored hand paddles that were large enough to be seen over the crowd [Pine, 2003:13].

## FACILITY AND FLOOR PLAN DESIGN

### Medical Consultations

Similar to the screening activity, this function or station assists clients with possible complications to determine whether they should be treated and how.

## FACILITY AND FLOOR PLAN DESIGN

### Dispensing / Vaccination Station

The core function of the ACS/POD and an activity with a set location/station, there are a few discrete methods identified:

1. Single: this station dispenses the same medication/vaccination to every patient. It is considered by some as an ***"express"*** approach to separate the simple cases from those of greater uncertainty or complication (who go to Multiple below).

2. Multiple: this station has several medications available, thereby accommodating those with potential complications from the chosen standard medication/vaccine at the Single station. It is often referred to as "Assisted" due to the additional time and care in providing pharmacotherapeutic consultation.

*NOTE: An ACS/POD site plan should include a designated pharmacist or other health professional to monitor the administration of vaccines or medications as a quality assurance measure. This person can alternatively administer vaccines and also float among cases and stations.

**Best Practices – Give Vaccinators a Rest:** Following the CDC guidelines, San Francisco stationed two vaccinators at each vaccination station during a small pox ACS exercise. This configuration allows the vaccinators to rest, possibly avoiding repetitive motion injuries. The "resting" vaccinators witnessed signatures on vaccination consent forms and collected forms [Pine, 2003:13].

**Best Practices – Improve Patient Throughput:** Montgomery County, Maryland staged a small pox mass vaccination exercise June 21, 2004 named Operation Dagwood. During this exercise clinic managers were able to increase patient flow from 267 patients per hour to 293 patients per hour simply by having the next patient wait in a spot next to the vaccination table [Aaby, 2005].

## FACILITY AND FLOOR PLAN DESIGN

### Form Collection and Exit

The fourth core function of any ACS/POD is the deployment of staff to manage the post-vaccine/medication activities prior to the client's exit from the ACS/POD facility or grounds. Exit staff may collect any forms routed to them for that purpose, provide reinforcement of instructions made by videos or staff, verify the accuracy of the forms filled including the client's contact information, and also perform quality control interviews to ensure clients received all the correct medications and received all the services they need.

**Best Practices – Reduce the Number of Staff:** Allowing vaccination assistants to collect paperwork and provide exit counseling can reduce the number of staff members. Philadelphia implemented this configuration at an influenza clinic held October 7, 2005. To ensure that paperwork did not pile up at the vaccination stations, float staff circulated through the vaccination clinic collecting paperwork.

## SUPPORT FUNCTIONS AND SUPPLY CHAIN MANAGEMENT

### Overview

This section outlines the support functions critical to the ensuring the effectiveness and efficiency of the core functions and client flows described in sections I and II. Support functions, often called "Logistics," are critical to the successful operation of an ACS/POD, especially when the ACS/POD will run for many consecutive hours/days (e.g. vaccine re-supply, food services, facility maintenance) and when the scenario causing the mass vaccination is of crisis proportion (e.g. security and traffic/crowd control).

For each of the following areas it is important to anticipate the institutional partners who can supply the necessary expertise, tools and equipment. These include but are not limited to: Public Schools, Metropolitan Police, Transportation, IT Departments, translators, food services, tow truck companies, and others. The coordination of these services should be clearly spelled out and at a minimum must include the identification of key individuals to act as central coordinating staff (such as Site Managers).

NOTE: One of the most common errors in planning an ACS/POD is an underestimation of the support staff needed for smooth operations. Half of the battle in making an ACS/POD optimal is crowd flow and control – and other logistics that make the vaccination/prophylaxis operation run smoothly.

## SUPPORT FUNCTIONS AND SUPPLY CHAIN MANAGEMENT

### Drug / Vaccine Inventory, Preparation and / or Re-supply

*The Following is excerpted from page 18 and 19 of "Community-Based Mass Prophylaxis: A Planning Guide for Public Health Preparedness," ARHQ Publication No. 04-0044, August 2004.

> "CDC SNS supplies both unit-of-use antibiotic regimen bottles and bulk supply of antibiotics and vaccines that can be repackaged at central materiel distribution centers such as the Receipt, Store, and Stage (RSS) site. Inventory support staff at each ACS/POD will be responsible for restocking dispensing stations with ready-to-use doses of antibiotics and/or reconstituted vaccines.
>
> "Staff training will vary depending on the type of agent targeted and the type of vaccine or antibiotics used. For example in response to a smallpox threat, re-supply staff should receive training in cold-chain techniques and proper use of mobile cold storage devices (e.g., Vaxicools)."

## SUPPORT FUNCTIONS AND SUPPLY CHAIN MANAGEMENT

### Security and Traffic / Crowd Control

*The Following is excerpted from page 18 and 19 of "Community-Based Mass Prophylaxis: A Planning Guide for Public Health Preparedness," ARHQ Publication No. 04-0044, August 2004.

> "[ACS/POD] security includes maintaining crowd control both outside and inside the [ACS/POD] as well as securing medication stocks, confidential patient information, and communication and computer equipment inside the [ACS/POD]. Additionally, security staff is needed to ensure the personal safety of [ACS/POD] staff. While the past several years have seen increasing attention by the public health community to these security needs for mass prophylaxis campaigns, there is as yet no consensus on the number of individuals required to achieve these goals. One approximation (derived from live exercises at several U.S. sites with the SNS training package (the "TED") is that for every four to five core staff assigned to the [ACS/POD] there should be approximately one security staff."

**NOTE:** While the security to staff ratio may be of use as a rule of thumb, a safer predictor of security staff requirements could be derived from the number of clients expected/allowed to be at the ACS/POD site at any particular time. This ratio would vary based upon the scenario (i.e. higher security presence when circumstances are of a crisis nature and crowd control and riot prevention are the primary goals for their involvement).

**Best Practices – Colored Tape and Crowd Control:** San Francisco's Department of Health recommends using colored tape on the floor of the ACS to help patients move from stations to station [Pine, 2003]. Arrows can direct patients to the next station, while X's show them where to stand at each station.

**Best Practices – Stop them at the Door!** During October 2001 New York City experienced an Anthrax outbreak. As a result they implemented their ACS plan that had been developed in 1999. One key to the success of controlling the outbreak was the ability to control the flow of traffic at the ACSs. Screeners were stationed outside each ACS and were issued clear eligibility requirements for patients that were to be treated as well as a list of names of personnel staffing the ACS. As a result of this planning, the "worried well" were prohibited from entering the ACS and afflicted patients were efficiently treated. [Blank *et.al*, 2003].

## SUPPORT FUNCTIONS AND SUPPLY CHAIN MANAGEMENT

### Client / Patient Traffic Directors

*The Following is excerpted from page 18 and 19 of "Community-Based Mass Prophylaxis: A Planning Guide for Public Health Preparedness," ARHQ Publication No. 04-0044, August 2004.

> "[ACS/POD] sites and entry points must be externally identified using appropriate signage (e.g., using relevant languages in areas with non-English speaking populations). Inside the [ACS/POD] s, personnel are needed to help direct patients from station to station and to assist in managing crowds when bottlenecks form."

NOTE: this is connected to "core support staff." Line Staff are the critical implementers of these functions.

## SUPPORT FUNCTIONS AND SUPPLY CHAIN MANAGEMENT

### Translation and Interpretation Services

*The Following is excerpted from page 18 and 19 of "Community-Based Mass Prophylaxis: A Planning Guide for Public Health Preparedness," ARHQ Publication No. 04-0044, August 2004.

> "Planning for translation services includes ethnographic evaluation of covered populations and identification of personnel who will be available to provide appropriate translation services under crisis conditions."

## SUPPORT FUNCTIONS AND SUPPLY CHAIN MANAGEMENT

### Communications/Information Technology Infrastructure

*The Following is excerpted from page 18 and 19 of "Community-Based Mass Prophylaxis: A Planning Guide for Public Health Preparedness," ARHQ Publication No. 04-0044, August 2004.

> "Secure and reliable communication links inside each [ACS/POD], between different [ACS/POD]s in a given community, and from [ACS/POD]s to a central Command and Control center are critical to the successful implementation of any [ACS/POD] plan. In addition, key [ACS/POD] operations including inventory management and data entry may require computer support and secure Internet access for web-based services."

## SUPPORT FUNCTIONS AND SUPPLY CHAIN MANAGEMENT

### Data Entry and Analysis

*The Following is excerpted from page 18 and 19 of "Community-Based Mass Prophylaxis: A Planning Guide for Public Health Preparedness," ARHQ Publication No. 04-0044, August 2004.

> "Data entry staff may be needed to transfer patient information from written forms to computerized databases to facilitate epidemiological investigation of the attack, assessment of the mass prophylaxis campaign, and follow-up care for treated patients."

## SUPPORT FUNCTIONS AND SUPPLY CHAIN MANAGEMENT

### Food and Beverage Services and Supplies

*The Following is excerpted from page 18 and 19 of "Community-Based Mass Prophylaxis: A Planning Guide for Public Health Preparedness," ARHQ Publication No. 04-0044, August 2004.

> "Local factors will determine whether [ACS/POD]s can support on-site food preparation and/or distribution for staff. If not, planners will need to find alternative means of providing meals, snacks, and beverages during [ACS/POD] activations."

## SUPPORT FUNCTIONS AND SUPPLY CHAIN MANAGEMENT

### Facility Maintenance Staff and Contacts

It is imperative to have access to and technical support for any room or equipment in the facility being used as an ACS/POD. As such, having someone with keys to storage rooms, the login information and passwords on borrowed facility computers, expertise on using the facility's video equipment and other appropriate requirements will be necessary for a smooth operation. ACS/POD activities can come to a halt or major stall if facility access is not ready available. In addition, problems with toilet facilities, kitchen and food services, medical waste disposal areas, secure areas and other facility-specific issues should be anticipated.

# THE PRIMARY TRIAGE POINT CONOPS

## Introduction

The ACS may also act as a primary triage point or staging area. In this capacity, the ACS would be used to determine which patients require hospitalization, which patients need palliative treatment (possibly offered by the ACS itself), and which patients are non-infected 'worried well' who do not require medical treatment.

The goal for the ACS primary triage point, therefore, is not to increase surge capacity directly, but to more efficiently allocate precious acute care resources to those patients who stand the greatest chance of benefiting. In doing so, the ACS primary triage point will mitigate a surge by reducing the overall burden on the public health systems in an effective and ethical manner.

# OPERATIONS

## Triage Overview

The concept of operations described here will address only the Primary Triage Point ACS concept, but in a pandemic situation it would make sense to collocate a limited, palliative, or observational care intake unit such as that described in the Low Acuity Care ACS concept.

The triage protocol that follows was developed specifically for an influenza pandemic.[62] It is based on research, best evidence, expert panels, stakeholder consultations, and ethical considerations. This protocol may be used in an ACS to assess all patients during a pandemic, including those who need general medical assistance but show no signs of influenza infection.

This protocol has 3 main components:

- Inclusion criteria
- Exclusion criteria
- Prioritization tool

The inclusion criteria identify patients who may benefit from admission to critical care and primarily focus on respiratory failure.

The exclusion criteria determine who will not benefit from admission to critical care and can be broken down into 3 categories:

- Patients who have a poor prognosis despite care in an ICU
- Patients who require resources that simply cannot be provided during a pandemic
- Patients with advanced medical illnesses who already have a poor prognosis and a high likelihood of death even without their current concomitant critical illness.

[62] M.D. Christian, et al., 'Development of a triage protocol for critical care during an influenza pandemic', *Canadian Medical Association Journal*, Vol. 175, No. 11 (November 2006).

The prioritization tool allows ACS triage staff to make ethical, consistent, and efficient acute care resource decisions. The following is a basic summary of the triage color codes and their meaning:

- **Blue**
  - The patient is not expected to survive
  - Palliative or observational care is recommended, which may be offered directly by the ACS
  - If patient is already receiving critical care, s/he should be discharged to make room for those who stand a greater chance of benefiting from scarce resources
- **Red**
  - Patient should be directed to the hospital for critical care
  - Patient receives critical care resource priority over all other triage codes
- Yellow
  - If resources permit, patient should be directed to the hospital for critical care but priority must be given to code red patients.
- Green
  - Discharge or reassess patient as necessary

Patient flow is not necessarily unidirectional in this triage protocol. Under the prioritization tool, patients are reassessed after 48 hours and 120 hours. Those who improve under observational treatment may become candidates for acute care resources just as patients who deteriorate under acute care treatment may be discharged to observational/palliative care at the ACS.

# OPERATIONS

## Pandemic Influenza Triage Protocol and Prioritization Tool

**Pandemic Influenza Triage Protocol** [63]

1. Assess whether the patient meets the inclusion criteria

- If yes, proceed to step 2
- If no, reassess patient later to determine whether clinical status has deteriorated

2. Assess whether the patient meets the exclusion criteria

- If no, proceed to step 3
- If yes, assign a "blue" triage code; *do not* transfer the patient to critical care; continue current level of care or provide palliative care as needed

3. Proceed to triage prioritization tool for initial assessment, repeat after 48 hours and 120 hours.

**Inclusion Criteria**
The patient must have 1 of the following:
A. Requirement for invasive ventilation support

- Refractory hypoxemia ($SpO_2 < 90\%$ on non-rebreather mask of $FIO_2 > 0.85$)

[63] M.D. Christian, et al., 'Development of a triage protocol for critical care during an influenza pandemic', *Canadian Medical Association Journal*, Vol. 175, No. 11 (November 2006).

- Respiratory acidosis (pH < 7.2)
- Clinical evidence of impending respiratory failure
- Inability to protect or maintain airway

B. Hypotension (systolic blood pressure < 90 mm Hg or relative hypotension) with clinical evidence of shock (altered level of consciousness, decreased urine output or other evidence of end-organ failure) refractory to volume resuscitation requiring vasopressor or inotrope support that cannot be managed in ward setting

**Exclusion Criteria** [64]

The patient is excluded from admission or transfer to critical care if *any* of the following is present:

A. Severe trauma

B. Severe burns of patient with any 2 of the following:

- Age > 60 years
- > 40% of total body surface area affected
- Inhalation injury

C. Cardiac arrest

- Unwitnessed cardiac arrest
- Witnessed cardiac arrest, not responsive to electrical therapy (defibrillation or pacing)
- Recurrent cardiac arrest

D. Severe baseline cognitive impairment

E. Advanced and irreversible immunocompromise

H. Severe and irreversible neurologic event or condition

I. End-stage organ failure meeting the following criteria:

- Heart
  - NYHA class III or IV heart failure
- Lungs
  - COPD with $FEV_1$ < 25% predicted, baseline < 55 mm Hg, or secondary pulmonary hypertension
  - Cystic fibrosis with postbronchodilator $FEV_1$ < 30% or baseline $PaO_2$ < 55 mm Hg
  - Pulmonary fibrosis with VC or TLC < 60% predicted, baseline $PaO_2$ < 55 mm Hg, or secondary pulmonary hypertension
  - Primary pulmonary hypertension with NYHA class III or IV heart failure, right atrial pressure > 10 mm Hg, or mean pulmonary arterial pressure > 50 mm Hg
- Liver
  - Child-Pugh score ≥ 7

J. Age > 85 years

K. Elective palliative surgery

[64] Note: $SpO_2$ = oxygen saturation measured by pulse oximetry, $FIO_2$ = fraction of inspired oxygen, NYHA = New York Heart Association, COPD = chronic obstructive pulmonary disease, $FEV_1$ = forced expiratory volume in 1 second, $PaO_2$ = partial pressure of arterial oxygen, VC = vital capacity, TLC = total lung capacity.

## Pandemic Influenza Triage Prioritization Tool

### Initial assessment

| Triage code | Criteria | Action or priority |
|---|---|---|
| **Blue** | Exclusion criteria met or SOFA score > 11* | • Manage medically<br>• Provide palliative care as needed<br>• Discharge from critical care |
| **Red** | SOFA score ≤7 or single-organ failure | Highest priority |
| **Yellow** | SOFA score 8–11 | Intermediate priority |
| **Green** | No significant organ failure | • Defer or discharge<br>• Reassess as needed |

### 48-hour assessment

| Triage code | Criteria | Action or priority |
|---|---|---|
| **Blue** | Exclusion criteria met or SOFA score > 11<br>or SOFA score stable at 8-11 with no change | • Provide palliative care<br>• Discharge from critical care |
| **Red** | SOFA score < 11 and decreasing | Highest priority |
| **Yellow** | SOFA score stable at < 8 with no change | Intermediate priority |
| **Green** | No longer dependant on ventilator | • Discharge from critical care |

### 120-hour assessment

| Triage code | Criteria | Action or priority |
|---|---|---|
| **Blue** | Exclusion criteria met or SOFA score > 11<br>or SOFA score < 8 with no change† | • Provide palliative care<br>• Discharge from critical care |
| **Red** | SOFA < 11 and decreasing progressively | Highest priority |
| **Yellow** | SOFA < 8 with minimal decrease<br>(< 3-point decrease in past 72 h) | Intermediate priority |
| **Green** | No longer dependant on ventilator | • Discharge from critical care |

*If an exclusion criterion is met or the SOFA score is > 11 anytime from the initial assessment to 48 hours afterward, change the triage code to Blue and proceed as indicated.
†If an exclusion criterion is met or the SOFA score is > 11 anytime from 48 to 120 hours afterward, change the triage code to Blue and proceed as indicated.

**Scoring Criteria for the Sequential Organ-Failure Assessment (SOFA) score**

| | Score | | | | |
|---|---|---|---|---|---|
| Variable | 0 | 1 | 2 | 3 | 4 |
| $PaO_2/FIO_2$, mm Hg | > 400 | ≤ 400 | ≤ 300 | ≤ 200 | ≤ 100 |
| Platelet count, $\times 10^6$/L | > 150 | ≤ 150 | ≤ 100 | ≤ 50 | ≤ 20 |
| Bilirubin level, mg/dL (µmol/L) | < 1.2 (< 20) | 1.2–1.9 (20–32) | 2.0–5.9 (33–100) | 6.0–11.9 (101–203) | > 12 (> 203) |
| Hypotension† | None | MABP < 70 | Dop ≤ 5 | Dop > 5<br>Epi ≤ 0.1<br>Norepi ≤ 0.1 | Dop > 15<br>Epi > 0.1<br>Norepi > 0.1 |
| Glasgow Coma score | 15 | 13–14 | 10–12 | 6–9 | < 6 |
| Creatinine level, mg/dL (µmol/L) | < 1.2 (< 106) | 1.2–1.9 (106–168) | 2.0–3.4 (169–300) | 3.5–4.9 (301–433) | > 5 (> 434) |

Note: $PaO_2$ = partial pressure of arterial oxygen; $FIO_2$ = fraction of inspired oxygen; MABP = mean arterial blood pressure, in mm Hg;

# SITE SELECTION

## Location

The triage point ACS should be 'ideally located near but physically separate from hospital emergency departments in order to minimize exposure of hospitalized patients to influenza.'[65] Hospital proximity is of paramount importance for this ACS facility, as ongoing triage decisions will make it necessary to transfer patients between acute care at the hospital and palliative/observational treatment at the ACS (if available).

- The frequent rotation of patients under this triage model will keep resource allocation at peak efficiency, but it will also necessitate medical updates and a high level of coordination between the ACS and the hospital. Therefore, it is crucial that the site be on hospital grounds or very nearby.

[65] C. Lam, et al., 'The Prospect of Using Alternative Medical Care Facilities in an Influenza Pandemic', *Biosecurity and Bioterrorism*, Vol. 4, No. 4 (2006), p. 386.

# PATIENT FLOW

## Overview

The floor plan design of triage point ACS should generally follow the low acuity ACS design, with the exception of the front entrance intake / registration area. In a triage situation, the front entrance needs an additional pre-triage / greeting station which can provide quick assessments.

### Pre-Triage (Greeting Station)

Greeters and/or those conducting pre-screening activities are responsible for controlling the intake of patients into the ACS as well as working to identify and isolate those arriving at the facility who are clearly ill with influenza and require immediate medical evaluation/attention. These screeners also help identify those who might not show symptoms but who have been at a higher risk of exposure to influenza. These greeters can distribute and review forms, thereby directing clients to the most appropriate station or staff. In short, these staff members function as the gatekeepers for the facility and represent the key control mechanism for regulating the flow into the ACS.

### Triage

Those patients who are directed inside the ACS for further evaluation by medical staff will be triaged according to the prioritization tool. In order to minimize influenza cross contamination during a pandemic, infected patients and non-infected patients should be sent to separate triage teams via separate routes. Medical staff should at all times assume they are treating influenza patients (and take appropriate PPE precautions) no matter which cohort of patients they are evaluating.

# Appendix A

**Sample Emergency Legislative Orders (Colorado)**

**Draft Gubernatorial Orders**

**Notes on Use:** Directly authorizes hospitals to cease admissions and transfer patients. **Provides that hospital emergency departments may determine on their own, without central direction from CDPHE, whether they have reached capacity to examine and treat patients.** Authorizes hospital emergency departments to resume admissions when they have determined that they have the capacity to do so. The pertinent provisions are contained in paragraphs 2 A and B. Declares that this order does not conflict with EMTALA.

**EXECUTIVE ORDER 1.1**

**Ordering Hospitals to Transfer or Cease the Admission of Patients to Respond to the Current Disaster Emergency**

Pursuant to the authority vested in the Office of the Governor of the State of Colorado, and pursuant to relevant portions of the Colorado Disaster Emergency Act, § 24-32-2100 et seq., C.R.S. (2001), I, Bill Owens, Governor of the State of Colorado, issue this Executive Order as follows:

1. Background and Need

On ____, 200_, acting pursuant to § 24-32-2104(8), the Governor's Expert Emergency Epidemic Response Committee ("Committee") determined that an emergency epidemic exists in the State of Colorado [or name county]. I issued Executive Order _____, dated _____, 200_, declaring the existence of a Disaster Emergency, pursuant to C.R.S. § 24-32-2104, in the State of Colorado and activating the State Emergency Operations Plan.

Acting in accordance with C.R.S.§ 24-32-2104(8)(d), and the State Emergency Function (SEF) #8 provisions of the State Emergency Plan, the Committee has found that:

A. An emergency epidemic exists infecting or exposing a great number of people to disease, agents or toxins;

B. The number of persons seeking medical treatment at hospitals may far exceed the capacity of any given hospital;

C. Hospitals who have reached capacity may need to cease admitting patients. Hospitals may also need to transfer such patients to a separate facility without first stabilizing the medical condition of the patient or obtaining the individual's written or informed consent for such transfer.

D. The transfer of patients from hospitals that have reached capacity to other specified care facilities will combat the current epidemic and promote the public health.

Therefore, pursuant to C.R.S. § 24-32-2104(8)(e)(II), the Committee has advised me that when a hospital has reached capacity for examination and treatment of patients, an executive order authorizing those hospitals to transfer or cease admission of patients or perform medical examinations of persons is a reasonable and appropriate measure to reduce or prevent the spread of the disease, agent or toxin and to protect the public health.

Under normal circumstances, the federal Emergency Medical Treatment and Active Labor Act (EMTALA), 42 U.S.C. § 1395dd, requires hospitals receiving Medicare funds to provide appropriate

medical screening to determine whether a patient has an emergency medical condition. EMTALA also prohibits a hospital from transferring a patient with an emergency medical condition unless and until that condition has been stabilized. Thus, in normal circumstances, the purpose of EMTALA is to prevent hospital emergency departments from "dumping" patients who are unable to pay. EMTALA further provides that:

> Any individual who suffers personal harm as a direct result of a participating hospital's violation of a requirement of this section may, in a civil action against the participating hospital, obtain those damages available under the law of the state in which the hospital is located ….
>
> 42 U.S.C. § 1395dd(d)(3)(A).

Finally, EMTALA states:

> The provisions of this section do not preempt any State or local law requirement, except to the extent that the requirement directly conflicts with a requirement of this section.
>
> 42 U.S.C. § 1395dd(f).

C.R.S. § 24-32-2104(8)(e)(II) specifically empowers the Governor, upon the advice of the Committee, to order hospitals "to transfer or cease admission of patients or perform medical examinations of persons."

When the Governor declares a disaster emergency in response to an emergency epidemic, C.R.S. § 24-32-2111.5(2) provides in pertinent part that:

> The conduct and management of the affairs and property of each hospital, physician … or emergency medical service provider shall be such that they will reasonably assist and not unreasonably detract from the ability of the state and the public to successfully control emergency epidemics that are declared a disaster emergency. Such persons and entities that in good faith comply completely with board of health rules regarding the emergency epidemic and with executive orders regarding disaster emergency shall be immune from civil or criminal liability for any action taken to comply with the executive order or rule.

2. Mission and Scope

This Executive Order orders the following:

A. For the duration of the emergency epidemic or until instructed by the Colorado Department of Public Health and Environment (CDPHE), at any time when a hospital has determined that its emergency department has reached capacity to examine and treat patients, the hospital is authorized to cease admissions and transfer patients without determining whether a patient has an emergency medical condition and without first stabilizing the medical condition of the patient or obtaining the individual's written or informed consent to refuse such transfer. At any time when such hospital emergency department has available capacity, the hospital shall resume patient screening and admissions.

B. I am issuing this Order to give hospitals flexibility to manage their emergency patient caseload in the most efficient and effective manner to meet the present emergency epidemic.

C. Hospitals complying in good faith with this Executive Order shall be immune from civil or criminal liability under state law pursuant to C.R.S. § 24-32-2111.5 (2).

D. This Executive Order does not conflict with the purposes of EMTALA. In normal circumstances, EMTALA is intended to prevent the denial of treatment for lack of a person's ability to pay. The present epidemic is an emergency, and I am authorizing hospitals to transfer or cease admitting patients so as to provide an opportunity for a greater number of people to receive care at separate facilities. Therefore, it is my intent that EMTALA does not preempt the provisions of the state's Disaster Emergency Act or this Executive Order.

E. Further, it is my intent in issuing this Executive Order that hospitals who comply will be immune from liability under state law. In normal circumstances, if a hospital does not observe the requirements of EMTALA, that statute provides a private civil remedy to individuals for "damages available under the law of the state in which the hospital is located …." By invoking the immunity provisions of C.R.S. § 24-32-2111.5 (2), it is my intent that the Disaster Emergency Act provisions be the "law of the state" for purposes of any future private action under EMTALA. Since there is no liability under state law, it is my intent that there are no "damages available" under state law that can be recovered under EMTALA against any hospital that complies with this Executive Order.

3. Duration

This Executive Order shall expire thirty (30) days from the date of its signature, unless rescinded or extended by Executive Order.

Given under my hand and
The Executive Seal of the
State of Colorado, this ___
Day of _____, 200_.
Bill Owens, Governor

**Notes on Use:** Authorizes the seizure of named drugs from "outlets" (as defined in the pharmacy statutes.) Embargoes the supply of the named drugs in the possession of the outlets. Exempts from seizure those supplies that CDPHE regulation requires certain facilities and organizations to keep for chemoprophylaxis of their employees.

**EXECUTIVE ORDER 2.0**

**Concerning the Procurement and Taking of Certain Medicines and Vaccines Required to Respond to the Current Disaster Emergency**

Pursuant to the authority vested in the Office of the Governor of the State of Colorado, and pursuant to relevant portions of the Colorado Disaster Emergency Act, § 24-32-2100 et seq., C.R.S. (2001), I, Bill Owens, Governor of the State of Colorado, issue this Executive Order as follows:

1. Background and Need

On ____, 200_, acting pursuant to § 24-32-2104(8), the Governor's Expert Emergency Epidemic Response Committee ("Committee") determined that an emergency epidemic exists in the State of Colorado [or name county]. I issued Executive Order _____, dated _____, 200_, declaring the existence of a Disaster Emergency, pursuant to C.R.S. § 24-32-2104, in the State of Colorado and activating the State Emergency Operations Plan.

Acting in accordance with C.R.S. § 24-32-2104(8)(d), and the State Emergency Function (SEF) #8 provisions of the State Emergency Plan, the Committee has found that:

A. An emergency epidemic exists infecting or exposing a great number of people to disease, agents or toxins;

B. Medicines and vaccines administered to infected or exposed people may combat or prevent the spread of the epidemic;

C. The necessary medicines and vaccines are in the possession of registered prescription drug outlets for retail and wholesale distribution, and

D. Public health officials and authorized disaster emergency personnel should control the supply and administration of these available supplies of the medications and vaccines to combat the emergency epidemic.

Therefore, pursuant to C.R.S. § 24-32-2104(8)(e)(I), the Committee has advised me that the procurement and taking of sufficient supplies of medicines and vaccines is a reasonable and appropriate measure to reduce or prevent the spread of the disease, agent or toxin and to protect the public health.

During the continuance of any state of disaster, the Governor is authorized by C.R.S. § 24-32-2104(7)(d) to "commandeer or utilize any private property if the governor finds this necessary to cope with the disaster emergency." C.R.S. § 24-32-2111 provides for compensation for property so taken. C.R.S. § 24-32-2111.5 also provides for compensation for property commandeered or otherwise used in coping with a declared emergency epidemic.

2. Mission and Scope

This Executive Order orders the following:

A. For purposes of this Executive Order, the term "outlet" shall have the same meaning as defined in C.R.S. § 12-22-102 (23), as follows: "any prescription drug outlet, hospital, institution, nursing home, rural health clinic, convalescent home, extended care facility, family planning clinic, wholesaler, manufacturer, or mail vendor, other than a pharmacist, that has facilities in this state registered pursuant to [§ 12-22-120] and that engages in the dispensing, delivery, distribution, manufacturing, wholesaling or sale of drugs or devices." "Prescription drug outlet" shall mean "any outlet registered pursuant to [§ 12-22-120] where prescriptions are filled or compounded, and are sold, dispensed, offered, or displayed for sale," as provided in C.R.S. § 12-22-102(30.2).

B. Except as provided in paragraph E of this Order, people acting under the direction of the Executive Director or Chief Medical Officer of the Colorado Department of Public Health and Environment (CDPHE) or the director of a local health department, law enforcement officers, National Guard troops or any other person authorized by the State Emergency Plan (hereinafter referred to as "authorized disaster emergency personnel") are authorized to seize the following medicines or vaccines from any outlet:

1) [name drug]

2) [name drug]

C. Effective immediately, outlets are ordered to embargo all supplies of [name drug] and to cease the sale or other distribution of [name drug] until further notice.

D. Upon the request of any authorized disaster emergency personnel, outlets are ordered to turn over their entire supply of [name drug] or so much of it as may be requested.

E. CDPHE regulations require local public health agencies, hospitals, managed care organizations, regional emergency medical and trauma services advisory councils and the CDPHE itself to store supplies of antibiotics to be used as chemoprophylaxis for all employees of these organizations in emergency epidemic situations. All such supplies are exempt from this Order and not subject to seizure.

F. Authorized disaster emergency personnel shall keep records of the quantities of [name drug] seized from each outlet.

G. Upon cessation of the emergency epidemic or at a sooner time as determined by the governor, outlets shall be compensated for the seized medicines or vaccines, as provided by C.R.S. 24-32-2111 and 2111.5.

3. Duration

This Executive Order shall expire thirty (30) days from the date of its signature, unless rescinded or extended by Executive Order.

Given under my hand and
The Executive Seal of the
State of Colorado, this ___
Day of _____, 200_.
Bill Owens
Governor

**Notes on Use:** Authorizes physicians and nurses who hold a license in good standing issued by another state or who have an unrestricted inactive Colorado license to practice under the supervision of a Colorado licensed physician or nurse to meet the current emergency epidemic.

**COLORADO EXECUTIVE ORDER 4.0**

**Concerning the Suspension of Physician and Nurse Licensure Statutes to Response to the Current Disaster Emergency**

Pursuant to the authority vested in the Office of the Governor of the State of Colorado, and pursuant to relevant portions of the Colorado Disaster Emergency Act, § 24-32-2100 et seq., C.R.S. (2001), I, Bill Owens, Governor of the State of Colorado, issue this Executive Order as follows:

1. Background and Need

On ____, 200_, acting pursuant to § 24-32-2104(8), the Governor's Expert Emergency Epidemic Response Committee ("Committee") determined that an emergency epidemic exists in the State of Colorado [or name county]. I issued Executive Order _____, dated _____, 200_, declaring the existence of a Disaster Emergency, pursuant to C.R.S. § 24-32-2104, in the State of Colorado and activating the State Emergency Operations Plan.

Acting in accordance with C.R.S. § 24-32-2104(8)(d), and the State Emergency Function (SEF) #8 provisions of the State Emergency Plan, the Committee has found that:

A. An emergency epidemic exists infecting or exposing a great number of people to disease, agents or toxins;

B. There is a shortage of physicians and nurses licensed to practice in Colorado to treat the number of infected or exposed;

C. Physicians and nurses who are licensed in another state or who have inactive Colorado licenses are available and willing to treat infected or exposed people;

D. Use of all physicians and nurses, including those without a Colorado license, is necessary to combat the current epidemic.

Therefore, pursuant to C.R.S. § 24-32-2104(8)(e), the Committee has advised me that suspending physician and nurse practice statutes to enable more physicians and nurses to treat exposed and infected persons is a reasonable and appropriate measure to reduce or prevent the spread of the disease, agent or toxin and to protect the public health.

In non-emergency circumstances, a person practicing medicine must possess a license to practice in Colorado issued by the Board of Medical Examiners. C.R.S. § 12-36-106(2). However, a Colorado license is not required for the "gratuitous rendering of services in cases of emergency." C.R.S. § 12-36-106(3)(a). In general, a person may not practice as a practical or professional nurse unless licensed in Colorado by the Board of Nursing. C.R.S. § 12-38-123(1)(a). Nursing assistance in the case of an emergency is not prohibited. C.R.S. § 12-38-125(1)(c).

During the continuance of any state of disaster, the Governor is authorized by C.R.S. § 24-32-2104(7)(a) to suspend the provisions of any regulatory statute or the regulations of any state agency if strict compliance with the provisions of the statute or regulation would in any way "prevent, hinder, or delay necessary action in coping with the emergency."

C.R.S. § 24-32-2111.5 (2) requires that the "conduct and management of the affairs and property of each physician [and] health care provider… shall be such that they will reasonably assist and not unreasonably detract from the ability of the state and the public to successfully control emergency epidemics that are declared a disaster emergency."

2. Mission and Scope

This Executive Order orders the following:

A. The provisions of the Medical Practice Act and the Nurse Practice Act that require Colorado licensure to practice medicine or nursing are hereby suspended for those physicians and nurses in compliance with paragraph B below.

B. Physicians and nurses who can demonstrate that they hold an unrestricted license in good standing issued by another state, or whose license in Colorado is inactive and unrestricted, are authorized to practice medicine or nursing in Colorado for the purposes of combating the current epidemic so long as the unlicensed physician or nurse:

1) practices under the supervision of an identified Colorado licensed physician or nurse;
2) provides care only relating to the current epidemic as directed by the supervising physician or nurse; and
3) volunteers and provides services without charge to the State of Colorado or any patient or victim.

C. As provided in C.R.S. § 24-32-2111.5(2), health care providers that comply in good faith with the terms and directives of this executive order shall be immune from civil or criminal liability for any action taken to comply with this executive order. This immunity also applies to the supervisory activities provided by a physician or nurse under paragraph 2 B. of this Order.

3. Duration

This Executive Order shall expire thirty (30) days from the date of its signature, unless rescinded or extended by Executive Order.

Given under my hand and
The Executive Seal of the
State of Colorado, this ___
Day of _____, 200_.
Bill Owens
Governor

***Notes on Use:*** *Authorizes Colorado licensed physician assistants and EMTs to practice outside of their normal supervision but under the supervision of another physician to meet the emergency epidemic.*

**COLORADO EXECUTIVE ORDER 5.0**

**Concerning the Suspension of Certain Licensure Statutes to Enable More Colorado Licensed Physician Assistants and Emergency Medical Technicians to Assist in Responding to the Current Disaster Emergency**

Pursuant to the authority vested in the Office of the Governor of the State of Colorado, and pursuant to relevant portions of the Colorado Disaster Emergency Act, § 24-32-2100 et seq., C.R.S. (2001), I, Bill Owens, Governor of the State of Colorado, issue this Executive Order as follows:

1. Background and Need

On ____, 200_, acting pursuant to § 24-32-2104(8), the Governor's Expert Emergency Epidemic Response Committee ("Committee") determined that an emergency epidemic exists in the State of Colorado [or name county]. I issued Executive Order _____, dated _____, 200_, declaring the existence of a Disaster Emergency, pursuant to C.R.S. § 24-32-2104, in the State of Colorado and activating the State Emergency Operations Plan.

Acting in accordance with C.R.S. § 24-32-2104(8)(d), and the State Emergency Function (SEF) #8 provisions of the State Emergency Plan, the Committee has found that:

A. An emergency epidemic exists infecting or exposing a great number of people to disease, agents or toxins;

E. There is a shortage of physicians and nurses licensed to practice in Colorado to treat the number of infected or exposed;

F. Colorado licensed physician assistants and emergency medical technicians are available and willing to treat infected or exposed people;

G. Under current statutes and rules, Colorado licensed physician assistants and emergency medical technicians can only practice in association with or under the supervision of physicians by prior agreement.

H. Use of all Colorado licensed physician assistants and emergency medical technicians without these practice limitations is necessary to combat the current epidemic.

Therefore, pursuant to C.R.S. § 24-32-2104(8)(e), the Committee has advised me that suspending certain regulatory statutes to enable more Colorado licensed physician assistants and emergency medical

technicians physicians to treat exposed and infected persons is a reasonable and appropriate measure to reduce or prevent the spread of the disease, agent or toxin and to protect the public health.

The Medical Practice Act authorizes a physician to delegate to a licensed physician assistant the performance of acts that constitute the practice of medicine, but prohibits such physician from supervising more than two physician assistants at any one time. C.R.S. § 12-36-106(5)(a) and (b)(I).

The Emergency Medical and Trauma Services Act authorizes emergency medical technicians to perform duties subject to the medical direction of a physician in accordance with rules adopted by the Colorado Board of Medical Examiners. C.R.S. § 25-3.5-203(1)(a). Under Board Rule 500, a physician advisor must be responsible for a specific emergency service agency and individuals.

To respond to the current emergency epidemic, physician assistants and emergency medical technicians should be available and able to practice under the supervision of any licensed physician to afford treatment to the greatest number of infected individuals.

During the continuance of any state of disaster, the Governor is authorized by C.R.S. § 24-32-2104(7)(a) to suspend the provisions of any regulatory statute or the regulations of any state agency if strict compliance with the provisions of the statute or regulation would in any way "prevent, hinder, or delay necessary action in coping with the emergency."

C.R.S. § 24-32-2111.5 (2) requires that the "conduct and management of the affairs and property of each physician [and] health care provider… shall be such that they will reasonably assist and not unreasonably detract from the ability of the state and the public to successfully control emergency epidemics that are declared a disaster emergency."

2. Mission and Scope

This Executive Order orders the following:

A. The provisions of C.R.S. § 12-36-106(5)(a) and (b)(I), C.R.S. § 25-3.5-203(1)(a) and Section 3.2 of Rule 500 of the Board of Medical examiners are hereby suspended.

B. Colorado licensed physician assistants and emergency medical technicians physicians are authorized to perform the professional services for which they are licensed under the supervision of any Colorado licensed physician when providing care to individuals affected by the current emergency epidemic.

C. As provided in C.R.S. § 24-32-2111.5(2), health care providers that comply in good faith with the terms and directives of this executive order shall be immune from civil or criminal liability for any action taken to comply with this executive order. This immunity also applies to the supervisory activities provided by a physician under paragraph 2 B. of this Order.

3. Duration

This Executive Order shall expire thirty (30) days from the date of its signature, unless rescinded or extended by Executive Order.

Given under my hand and
The Executive Seal of the
State of Colorado, this ___
Day of _____, 200_.
Bill Owens
Governor

**EXECUTIVE ORDER 6.0**

**Concerning the Isolation and Quarantining of Individuals and Property in Response to the Current Disaster Emergency Epidemic**

Pursuant to the authority vested in the Office of the Governor of the State of Colorado, and pursuant to relevant portions of the Colorado Disaster Emergency Act, § 24-32-2100 et seq., C.R.S. (2001), I, Bill Owens, Governor of the State of Colorado, issue this Executive Order as follows:

**1. Background and Need**

On ____, 200_, acting pursuant to § 24-32-2104(8), the Governor's Expert Emergency Epidemic Response Committee ("Committee") determined that an emergency epidemic of _____ exists in the State of Colorado [or name county]. I issued Executive Order _____, dated _____, 200_, declaring the existence of a Disaster Emergency, pursuant to C.R.S. § 24-32-2104, in the State of Colorado and activating the State Emergency Operations Plan.

Acting in accordance with C.R.S. 24-32-2104(8)(d), and the State Emergency Function (SEF) #8 provisions of the State Emergency Plan, the Committee has found that:

A. An emergency epidemic of _____ exists infecting or exposing people to this disease;

B. [Name of disease] poses a serious threat to the public health and may cause death;

C. [Name of disease] is highly contagious;

C. To prevent the further spread of [name of disease] and protect the public health, it is necessary to isolate all individuals infected with the disease or to quarantine all individuals exposed to the disease.

Therefore, pursuant to C.R.S. § 24-32-2104(8)(e), the Committee has advised me that isolating and quarantining individuals are reasonable and appropriate measures to reduce or prevent the spread of the disease and to protect the public health.

Powers of Colorado Department of Public Health and Environment

C.R.S. § 25-1-107(1)(b) empowers the Colorado Department of Public Health and Environment (CDPHE) to "establish, maintain, and enforce isolation and quarantine, and, in pursuance thereof and for this purpose only, to exercise such physical control over property and the persons of the people within this state as the department may find necessary for the protection of the public health."

C.R.S. § 25-1-114(1)(a) states that it is unlawful for any person to "willfully violate, disobey, or disregard the provisions of the public health laws or the terms of any lawful notice, order, standard, rule, or regulation issued pursuant thereto…." C.R.S. § 25-1-114(4) provides that violation of such an order is a misdemeanor punishable by a fine of not more than one thousand dollars, or by imprisonment in the county jail for not more than one year, of both.

Powers of Local Boards of Health

Local boards of health have existing statutory powers to combat infectious disease epidemics. Local boards may isolate infected persons. C.R.S. §§ 25-1-637 to 640. Local boards can also establish quarantines areas. C.R.S. § § 25-1-631 to 634. Local boards are also empowered to take measures to prevent the spread of infectious disease. C.R.S. § 25-1-645.

**2. Mission and Scope**

This Executive Order orders the following:

**A. Definitions**. As used in this Executive Order,

(1) "Communicable period" means the time during which an infectious agent may be transferred directly or indirectly from an infected person to another person.

(2) "Incubation period" means the time interval between initial contact with an infectious agent and the first appearance of symptoms associated with the infection.

(3) "Infectious agent" means an organism that is capable of producing infection or infectious disease.

(4) "Isolation" shall mean the separation, for the period of communicability, of infected persons from others in such places and under such conditions as to prevent or limit the direct or indirect transmission of the infectious agent from those infected to those who are susceptible to infection or who may spread the agent to others.

(5) A person has "notice" of a fact when:

(a) He or she has actual knowledge of it; or
(b) He or she has received a notice or notification of it.

(6) "Quarantine" shall mean restriction of the activities of well persons who have been exposed to a case of communicable disease during its period of communicability to prevent disease transmission during the incubation period if infection should occur.

**B. People Subject to Isolation.** The Executive Director or Chief Medical Officer of the CDPHE or a local board of health shall immediately isolate all persons known to be infected with _____ for the period of communicability. All people subject to such isolation shall comply with the directions of the CDPHE or local board of health.

**C. People Subject to Quarantine**. The Executive Director or Chief Medical Officer of the CDPHE or a local board of health shall order the quarantine of any person who has been exposed to an infectious agent or was present at [name location] on [date] at [time]. Such people shall be subject to the terms of quarantine when they have received notice of the order.

**D. Restriction of Quarantined People**. Any such quarantined person shall:

(1) be confined to his or her home, and may not leave those premises for any purpose except as directed by the Executive Director or Chief Medical Officer of the CDPHE or a local board of health; or

(2) be confined to any other location designated by the Executive Director or Chief Medical Officer of the CDPHE or a local board of health; and

(3) not put himself or herself in contact with any person not subject to quarantine other than a physician or other health care provider.

**E. Restriction of People Not Subject to Quarantine**. No person, other than a person authorized by the Executive Director or Chief Medical Officer of the CDPHE or a local board of health, shall enter a quarantined premises or have physical contact with any quarantined person.

**F. Exceptions to Quarantine Restrictions**. No person subject to the quarantine order may leave the premises to which he is confined unless permitted by the Executive Director or Chief Medical Officer of the CDPHE or a local board of health.

**G. Enforcement of Quarantine**. Pursuant to state and local emergency operations plans, local law enforcement officials shall enforce the provisions of this quarantine order. [I have also called out the National Guard to respond to the current Disaster Emergency. While acting under call of the governor, an officer or member of the Colorado National Guard acts as a Peace Officer, Level III under C.R.S. §18-1-901(3)(l)(III). I am directing the National Guard to assist local law enforcement in enforcing this quarantine order.]

**H. Violation of this Quarantine**. Any person who violates this quarantine order may be subject to prosecution by the District Attorney for prosecution under C.R.S. § 25-1-114(4) or may be subject to civil fines for violating an order of a local board of health as provided in C.R.S. § 25-1-633 or 646.

**I. Care of Quarantined People**. Observance of this quarantine is vital to protect the public health. At the same time, compliance with the quarantine may pose a hardship to some people. I direct the Office of Emergency Management and local emergency management agencies to coordinate private or public efforts to take reasonable measures to provide adequate food, clothing, necessities or medication and medical care to quarantined people and people living in the household of any quarantined person who is affected by the quarantine.

**3. Duration**

This Executive Order shall expire _____ days from the date of its signature, unless rescinded or extended by Executive Order.

Given under my hand and
The Executive Seal of the
State of Colorado, this ___
Day of _____, 200_.

Bill Owens
Governor

# Appendix B

**Sample ACS Admission Orders** [66]

Patient Name/Stamp_____
Date_____

**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 D5W .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):**

[66] Skidmore, Appendix A.

**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___u SQ qAM
Regular ___u SQ qPM NPH___u 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:_____Date_____Time_____

RN Signature:_____Date _____Time____

# Appendix C

**Alternative Care Site Site Selection Matrix Tool** [67]

| Potential Sites: | Aircraft Hangers | Churches | Community or Recreation Centers | Convalescent Care Facilities | Convention Facilities | Fairgrounds | Government Buildings | Hotels/Motels | Meeting Halls | Military Facilities | National Guard Armories | Same Day Surgical Centers/Clinics | Schools | Sports Facilities / Stadiums | Trailers / Tents (Military and other) | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure** | | | | | | | | | | | | | | | | |
| Doors/corridors adequate size for gurneys | | | | | | | | | | | | | | | | |
| Floors | | | | | | | | | | | | | | | | |
| Loading dock | | | | | | | | | | | | | | | | |
| Parking for staff and visitors | | | | | | | | | | | | | | | | |
| Roof | | | | | | | | | | | | | | | | |
| Toilet facilities/showers (#) | | | | | | | | | | | | | | | | |
| Ventilation | | | | | | | | | | | | | | | | |
| Walls | | | | | | | | | | | | | | | | |
| **Total Space and Layout** | | | | | | | | | | | | | | | | |
| Auxiliary spaces (Rx, counselors, chapel) | | | | | | | | | | | | | | | | |
| Equipment/supply storage area | | | | | | | | | | | | | | | | |
| Family area | | | | | | | | | | | | | | | | |
| Food supply and prep area | | | | | | | | | | | | | | | | |
| Lab specimen handling area | | | | | | | | | | | | | | | | |
| Mortuary holding area | | | | | | | | | | | | | | | | |
| Patient decontamination areas | | | | | | | | | | | | | | | | |
| Pharmacy area | | | | | | | | | | | | | | | | |
| Staff areas | | | | | | | | | | | | | | | | |
| Utilities | | | | | | | | | | | | | | | | |
| Air conditioning | | | | | | | | | | | | | | | | |
| Electrical power (backup?) | | | | | | | | | | | | | | | | |

[67] S.V. Cantrill, S.L. Eisert, P. Pons, and C.E. Vinci, *Rocky Mountain Regional Care Model for Bioterrorist Events*, (August 2004), TAB-1

| Potential Sites: | Aircraft Hangers | Churches | Community or Recreation Centers | Convalescent Care Facilities | Convention Facilities | Fairgrounds | Government Buildings | Hotels/Motels | Meeting Halls | Military Facilities | National Guard Armories | Same Day Surgical Centers/Clinics | Schools | Sports Facilities / Stadiums | Trailers / Tents (Military and other) | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heating | | | | | | | | | | | | | | | | |
| Lighting | | | | | | | | | | | | | | | | |
| Refrigeration | | | | | | | | | | | | | | | | |
| Water (hot?) | | | | | | | | | | | | | | | | |
| **Communication** | | | | | | | | | | | | | | | | |
| Communication (# phones, local/long distance, intercom) | | | | | | | | | | | | | | | | |
| Two-way radio capability to main hospital | | | | | | | | | | | | | | | | |
| Wired for IT and internet access | | | | | | | | | | | | | | | | |
| **Other Services** | | | | | | | | | | | | | | | | |
| Ability to lock down facility | | | | | | | | | | | | | | | | |
| Accessibility/proximity to public transportation | | | | | | | | | | | | | | | | |
| Biohazard and other waste disposal | | | | | | | | | | | | | | | | |
| Laundry | | | | | | | | | | | | | | | | |
| Ownership/other uses during disaster | | | | | | | | | | | | | | | | |
| Oxygen delivery capability | | | | | | | | | | | | | | | | |
| Proximity to main hospital | | | | | | | | | | | | | | | | |
| **TOTAL RATING/RANKING (Largest number indicates best site)** | | | | | | | | | | | | | | | | |

Rating Scale
5 Equal to or same as hospital.
4 Similar to that of a hospital, but has SOME limitations (I.e. quantity/condition).
3 Similar to that of a hospital, but has some MAJOR limitations (I.e. quantity/condition).
2 Not similar to that of a hospital, would take modifications to provide.
1 Not similar to that of a hospital, would take MAJOR modifications to provide.
0 Does not exist in this facility or not applicable to event.

# Appendix D

## DC Department of Health
## Pandemic Influenza Preparedness Plan

## Chapter 5: Surge Capacity

### I. Introduction

The District of Columbia Department of Health's (DOH) strategy for health and medical surge capacity uses a modular approach to build on existing capability as needs grow. While prehospital and hospital communities have been engaged in assessing and building capability, additional sectors outside the hospital community (for example, clinics, physician offices, nursing homes) and associated health and medical support areas are necessary to add vital capacity to an organized system.

The proposal for DOH surge capacity provides immediate capacity through a mobile system while developing a process for sustainability using the mobile system as a hub to link existing assets. The mobile system will complement existing capability, facilitate interoperability, support personnel needs, and provide supplies and equipment for seventy-two hours of continuous operation without a need for replenishment.

### II. Purpose

Casualty projections for intentional as well as naturally occurring healthcare emergencies can overwhelm existing resources. Even modest projections of 500 casualties per million population, require an immediate need to expand capacity in triage and treatment, critical care, stress management and mental health, and the potential for isolation and quarantine. The crosscutting issues of personnel, supplies and equipment, and facilities highlight the complexities and disparities in existing capabilities in U.S. hospitals, highlights the need for a system that can synchronize and build needed resources. Local healthcare systems face severe limitations in meeting the needs of any surge in patient volume.
The District has 2904 staffed hospital beds with an additional 475 in federal facilities. District hospitals average 40 available staffed beds on any given day. Available staffed beds in specialty units (critical care, burn, and pediatric patient care) have varying capability. Staffing patterns follow the patient census, resulting in challenges in rapid expansion even if the physical structure and the supplies and equipment exist. When the Pentagon was attacked on September 11, 2001, hospitals used internal resources to make available 200-staffed beds in District hospitals. The acuity level of the capability was not captured. The number of patients generated from the horrific events of September 11 stressed the collective medical capability of the National Capital Region (NCR), but with resources internal to the hospital community and the public's willingness to delay their scheduled medical visits to others in need, NCR hospitals were able to meet the demand for inpatient services. This is not true during yearly routine flu season when hospitals have trouble meeting the critical care needs of patients with respiratory distress. The needs projected for biological events are even more challenging.

**A. Defining Surge Capacity**

The Joint Commission on Accreditation of Healthcare Organizations defines surge capacity as "potential patient beds; available space in which patients may be triaged, managed, vaccinated, decontaminated, or simply located; available personnel of all types; necessary medications, supplies and equipment; and even the legal capacity to deliver health care under situations which exceed authorized capacity. For hospitals and other healthcare facilities to meet demands for a rapid increase in services, associated health and medical support structure must have a process to seamlessly integrate their parallel systems. The SEMLES© surge approach encompasses the collective resources that support a rapid increase in health and medical services, including items such as:

- Broad incident management structure
- Communication systems
- Stress management
- Epidemiology and preventive medicine
- Laboratory
- Supplies and equipment support
- Transportation and patient evacuation assets
- Fatality management
- Administrative or command and control capability
- Veterinary, dental, and allied health support

Identifying the need to build surge capacity requires an assessment of existing capability, a projection of needs, and a gap analysis. The end state, or the point at which federal assistance may be available will define the surge needs. Figure 1 projects the gap in capability brought upon by a sudden surge in medical needs.

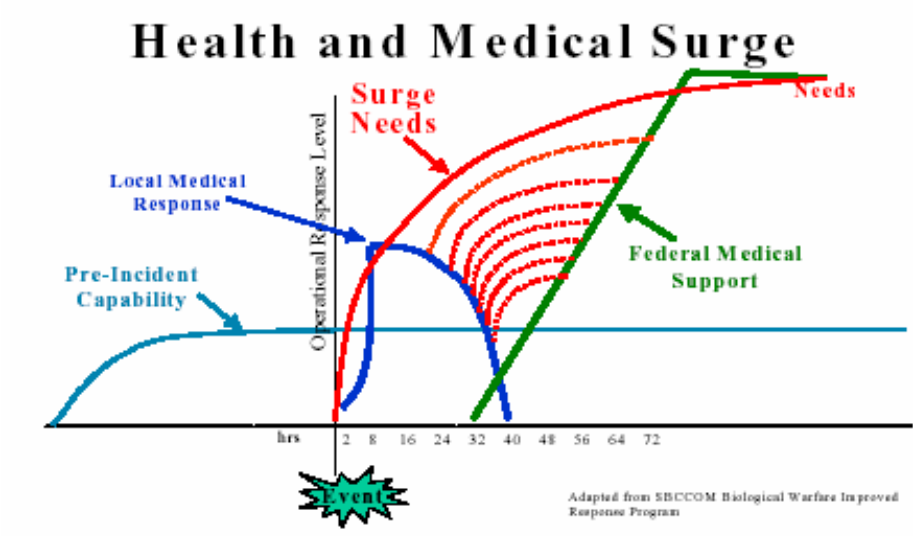



**Figure 1 Surge needs**

**B. Immediate Need**

DOH identified an immediate need to increase capability and capacity of the healthcare system in the District. After initial review of the hospital capability, DOH surge capacity established the following objectives:
• Synchronize existing capability
• Increase immediate capacity to manage at least 500 acute care victims
• Provide triage external to hospitals
• Prevent contamination of hospitals in contagious disease scenarios
• Identify a process to build initial capability while designing a sustainable long term solution
• Develop system resources for self-sufficiency with no resupply for 72 hours
• Establish regional interoperability

The need for isolation in a highly contagious disease situation compounds issues of surge capacity. The District of Columbia has 25 negative airflow isolation rooms dedicated to adult critical care. District emergency departments have 11 negative airflow rooms. The emergency department waiting areas are not equipped with negative airflow. Plans include increasing the number of negative airflow rooms and converting entire wings to isolation care.

## III. Focus

The District's surge capacity program establishes a hub for synchronizing all functional areas relative to health and medical operations. The hub will monitor existing capability, identify shortfalls, and provide a mechanism to fill gaps in existing capacity. The District plan establishes the following capabilities:
• An immediate deployable expansion capability supporting currently defined needs related to triage and treatment, patient care, and potential isolation and quarantine. The deployable site is designed as a facility for triage and treatment, critical care, minimal care, and holding. The total number of patient care space is dependent upon the configuration. Current projections include a 500 patient triage and treatment, sixteen critical care, and 15 minimal care option. A 50 patient minimal care option is available. The numbers are flexible and can be increased as necessary.
• Equipment and supplies to provide rapidly expanding support for 72 hours of continuous operations. All projected patient capacity will include 72 hours of operational capability. Pharmaceuticals are not included.
• A field-training site to integrate personnel and processes with integrated training and response team. Provides operational implementation for concept. The site will operate along the lines of the incident management system. It provides a hub to facilitate local as well as regional interoperability through training for all members of the health and medical communities. Will become the operational staff during an incident. The field training site will link with the Center for Domestic Preparedness and the Noble Training Center to facilitate standardized national interoperability.
• An embedded process for assessing and reevaluating to ensure a sustainable program and to provide a road map with defined measures of success.

## IV. Local and Regional Planning

Plans to increase care in facilities operating at or near capacity will impact current practice. Any significant increase in the burden of care to treat significant numbers of emergency casualties will limit the ability to manage routine, as well as emergency, care unrelated to the catastrophic event.

Comprehensive Emergency Management (CEM) is the cornerstone of emergency management and provides the basis for healthcare disaster management. The Domestic Preparedness Planning (DPP) from the Biological Terrorism Improved Response Program (BW-IRP) developed templates for action to increasing capability. The Metropolitan Medical Response System (MMRS) provides guidelines for coordinating and collaborating with regional partners as well as existing medical and healthcare assets to coordinate activities. The National Disaster Medical System (NDMS) addresses the need for deployable teams, definitive care, and evacuation. The current challenge is to engage all resources and to provide for synchronized
capability.

A local process that also synchronizes existing resources across jurisdictions can assist in developing needed surge capacity, must include synchronization of non-District assets. The District surge capacity will involve collaboration with non-District assets, however the initial focus will address organizing District assets in a way that can connect with non-District assets as the process matures. DOH is dedicated to participating with their partners.

**V. Comprehensive Health and Medical Surge Capacity**

The District's health and medical surge capacity operation fall into one of 6 different sectors. A seventh sector addresses regional and federal operations outside the District. Because all of the sectors have significantly different perspectives and different organizational structures, optimized surge capacity requires a comprehensive process to integrate activities across:

- Pre-hospital care (EMS)
- Hospital care
- Non-hospital healthcare assets
- Non-healthcare health and medical assets
- Non-health and medical assets that support health operations within the District
- Non-District assets (regional, national, and international).

**A. Pre-hospital Surge Capacity**

Pre-hospital care and EMS function under the fire service in the District. Their medical training is supported by DOH. EMS is a member of the traditional first responder community. The EMS community is not generally considered in the discussion of health and medical surge capacity. A review of pre-hospital surge capacity as it relates to the comprehensive health and medical community is necessary to identify system needs, capability and capacity to respond, and gaps.

**B. Hospital Surge Capacity**

Hospital care is the focus of the initial Bioterrorism Hospital Preparedness Program. An

assessment of capacity and capability was initiated with the DOH Hospital Preparedness Survey in July 2002. As surge capacity concepts evolve, hospital surge capacity should not be isolated, but rather be considered within the context of the entire health and medical system.

**C. Non-hospital Healthcare Surge Capacity**
Non-hospital healthcare assets include a plethora of capabilities including facilities, supplies and equipment, personnel, and a process to put them together. Non-hospital healthcare assets are needed to complement hospital capability. Non-hospital healthcare is the primary focus of this review.

**D. Non-healthcare Health and Medical Surge Capacity**
Non-healthcare health and medical assets include support services such as laboratory, pharmacy, radiology, and occupational health. While many of these assets are found within hospital functions, many are independent. Many of the non-healthcare health and medical assets are part of public health or community assets. Others are privately owned assets. Within the context of a coordinated surge capacity process, the non-healthcare health and medical assets should be balanced to provide for a smooth surge in capability.

**E. Non-health and Medical Direct Support for Surge Capacity**
Non-health and medical assets that support health operations include critical services such as food and water, sanitation, transportation, non-medical supplies, and security. Comprehensive surge capacity will coordinate the need for increased needs in these critical areas. Assessing capability as other resources expand and providing a process to maintain support is essential.

**VI. Partnerships and support teams**
Partnerships and support teams are emerging from the existing programs designed to improve local and regional hospital and public health preparedness. Support is gaining with interest in defining a regional approach. Federal support is focused on the DC VA Medical Center as well as the military hospitals and the National Capitol Region Joint Headquarters program. Federal programs within the District who have medical teams associated with their organizations are a part of other local and regional programs addressing surge capacity.

**A. Volunteer Coordination Planning**
The concept for recruitment and coordination of volunteers centers on an integrated an approach that crosses jurisdictional boundaries. The approach incorporates:
• Initially identification of the pool of volunteers available, working with area volunteer organizations
• Validation of volunteer qualifications
• Integration of volunteer resources, by functional area, into the resource allocations of community and regional response plans
• Preparation of the data system and supporting databases for coordination and resource allocation, tailored to response plans for particular crises

The end objective is rapid and efficient identification, assignment, mobilization and tracking of volunteer resources in a crisis response situation.

**B. Implementation**
A series of steps are essential to building a functioning system. Key to the approach is the designation of a position of volunteer coordinator. The coordinator and potentially the staff that works under that position will direct the implementation of the system and any subsequent operations that evolve.

• **Step 1 – The identification of a volunteer pool**. Initially the typology of volunteers is developed and evaluated in terms of existing response plans and resource needs. Once completed an outreach program is developed and coordinated through an interface with volunteer organizations citywide. All participating organizations are encouraged to interface, through the Internet, with the Volunteer Response Center Coordinator. The central system is automatically populated during a disaster by connecting directly to systems that support non-profit organizations that utilize volunteers on a day-to-day basis.

• **Step 2 – Credentialing.** After identification, the next step is to credential volunteers. The type of credential received will depend on volunteer status, job that one will perform, and needs of the organization. National security screening is the minimum credential. Professional licensure, certification, and education are primary areas that will need to be validated before credentialing, especially among medical professionals. Every volunteer will be credentialed before being activated in the Center's database.

• **Step 3 – Integration of Volunteers into Incident Response.** The integration of volunteers into a response activity will be accomplished by analyzing with response planners the available resources and the need to replenish dwindling resources over the course of an event. Templates will be developed for the allocation of volunteer resources. Resource allocation will be noted in the Center's database for each incident, with information on the timing and reporting location for each volunteer. In each case, backup and augmentation volunteers will be identified.

• **Step 4 – Implementation of the Supporting System.** A system is presently available to meet virtually all the requirements for implementation of the concept for volunteer recruitment and coordination. The system, Volunteer Coordination and Response System (VCRS) by *EAI Corporation*, **i**s comprised of software modules for recruitment, volunteer resources, plan allocation, and response. These are supported by databases that are interactive capable with both web based and PC based inputs.

**VII. Assumptions**
In developing a sustainable concept for surge capacity, the following assumptions are made:
• The capacity to expand healthcare capability beyond hospitals in necessary. Public health has the responsibility to synchronize existing health and medical capability and to plan and implement a system to rapidly expand this capacity.

• Hospitals are currently functioning at or near capacity under normal circumstances. They will maximize their capability to provide care for casualties from critical incidents as well as do everything they can to maintain normal operations. Elective procedures and routine care may have to be delayed during emergency operations.
• A modular approach with numerous interoperable options can provide solutions based on the needs of any one particular locality.
• A mobile solution will provide immediate capacity and can provide the hub for an operational system to synchronize available assets.
• A sustainable solution may be different within the District as well as across the region to coordinate and synchronize programs and to provide a template for the nation in optimizing surge capacity.