Modular Emergency Medical System

Expanding Local Healthcare Structure in a Mass Casualty Terrorism Incident

Prepared in response to the Nunn-Lugar-Domenici Domestic Preparedness Program by the Department of Defense, January 1, 2002

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Table of Contents

INTRODUCTION

Introduction

American citizens have recently been forced to realize that terrorism is a real threat to our nation at home and is not limited to overseas incidents. Because of terrorist acts such as the September 11, 2001 attacks on the Pentagon and both World Trade Center Towers, as well as the Oklahoma City bombing, domestic terrorism is increasingly on the minds of citizens. However, terrorist activities are no longer limited to simply detonating conventional bombs as the nation has now seen so dramatically. Biological terrorism has become a growing concern since the Gulf War, but even more so as America uncovers the extent of the plot surrounding the September 11 attacks.

According to experts, a well-executed, covert biological terrorism attack could produce large numbers of casualties, overwhelm a community or state's emergency resources, and present a catastrophic public health and medical emergency.

Public Law 104-201, Title XIV - The Defense Against Weapons of Mass Destruction Act of 1996 (also known as the Nunn-Lugar-Domenici Domestic Preparedness Act) provided the nation's first responders with training, equipment and exercises regarding emergency response to weapons of mass destruction (WMD). The Secretary of Defense was mandated to develop and carry out a program to improve the responses of federal, state, and local agencies to emergencies involving biological and chemical weapons. One product of this initiative is the Biological Warfare Improved Response Program (BWIRP), developed under the auspices of the U.S. Army Soldier and Biological Chemical Command (SBCCOM).

SBCCOM led a multi-agency task force that formulated an integrated emergency response approach to a terrorist's use of a biological weapon (BW). This approach is documented in the BW Response Template and embodies the concepts and specific activities that a state or local community might consider in evaluating or refining their own BW emergency preparedness plans. The BWIRP Template process identified, evaluated, and demonstrated the best practical approaches for improving response procedures to terrorist incidents involving biological weapons. The template addresses 13 major response activities. Together, these components represent an integrated response system. The 13 components of the generic BW Response Template (Figure 1) are categorized into operational decisions addressing three phases of response:

1. Continuous surveillance
2. Active investigation
3. Emergency response

The BW Response Template is available for detailed review to state and local government agencies in the 1998 Summary Report on BW Response Template and Response Improvements, Volumes 1 & 2 which may be requested through the Homeland Defense Business Unit (formerly the Domestic Preparedness Program; see section of this pamphlet titled "Points of Contact for Planning Assistance").

Modular Emergency Medical System Overview

In order to manage this potentially huge casualty load that would result from a covert bioterrorist attack, the BWIRP team

developed the Modular Emergency Medical System (MEMS) concept. The MEMS is one of 13 BWIRP Response Template components identified by the BWIRP Response Template team. MEMS addresses the gap in casualty care resources that would exist in most medical care jurisdictions today if a large number of BW victims were to go to neighborhood area hospitals. The MEMS is based on the rapid organization of two types of expandable patient care modules, the Neighborhood Emergency Help Center (NEHC) and the Acute Care Center (ACC). The MEMS concept also includes a Medical Command and Control (MCC) element, Casualty Transportation System (CTS), Community Outreach, Mass Prophylaxis, and Public Information components.

This pamphlet is not extensive in detail; rather it serves to introduce key characteristics of the MEMS concept and modules and presents an overview of the MEMS as one possible approach to use in planning. The MEMS is a highly adaptable planning guide that provides options and points of consideration that can be integrated in or tailored to any existing emergency plan to suit specific and unique jurisdictional requirements.

Management of this system is based on the nationally recognized Incident Command System/Incident Management System (ICS/IMS). This system incorporates a Unified Medical Branch (UMB) into the ICS (Figure 2). The MEMS strategy and modular concept approach is by no means a final solution, but should serve as a basis for advancing interagency dialog and represents one practical approach to managing a major non-communicable incident involving a civilian population. The MEMS concept has been developed considering non-communicable biological agents such as anthrax. This concept does not provide adequate consideration for an attack using a communicable biological agent such as Variola (smallpox) and Yersinia pestis (plague). A communicable incident is outside of the scope of this pamphlet. However, many of the strategies outlined in this document will also apply to attacks using communicable agents. In addition, many of these outlined and suggested techniques may be used for naturally occurring disasters, such as flooding, earthquakes, hurricanes, etc.

Note

It is strongly suggested that prior to emergency/disaster response plan development, the community's emergency management staff first conduct a thorough and extensive search and review of existing plans from all responder entities (i.e., law enforcement, fire, emergency medical service [EMS] and medical infrastructure) within their jurisdiction for overall utility and compatibility towards a coordinated, overarching plan. It is further suggested that a dialog be established between the community's emergency management staff, and state and federal emergency and health response partners (e.g., FEMA and DHHS). Each of these organizations have developed extensive disaster/emergency response plans and planning suggestions for state and local use.

Coordinated planning, supported by frequent exercises of the concepts and approaches, is very important. Without the development of written plans and frequent

exercises/field testing prior to an incident, emergency managers cannot coordinate or manage the response operations during a BW event.

Written interagency and mutual aid agreements and memorandums of understanding/agreement (MOUs/MOAs) with all parties involved should be in place before an incident occurs. Operational plans for the multi-tasked response system needs to be developed and thoroughly exercised. Each agency in the system needs to plan how to accomplish its responsibilities and coordinate within the system during the crisis. One valuable resource available to planners that addresses interagency coordination is the United States Government Interagency Domestic Terrorism Concept of Operations Plan whose signatories include the Department of Defense, the Department of Health and Human Services, the Federal Emergency Management Agency, the Department of Justice, the Department of Energy, the Environmental Protection Agency and the Federal Bureau of Investigation.

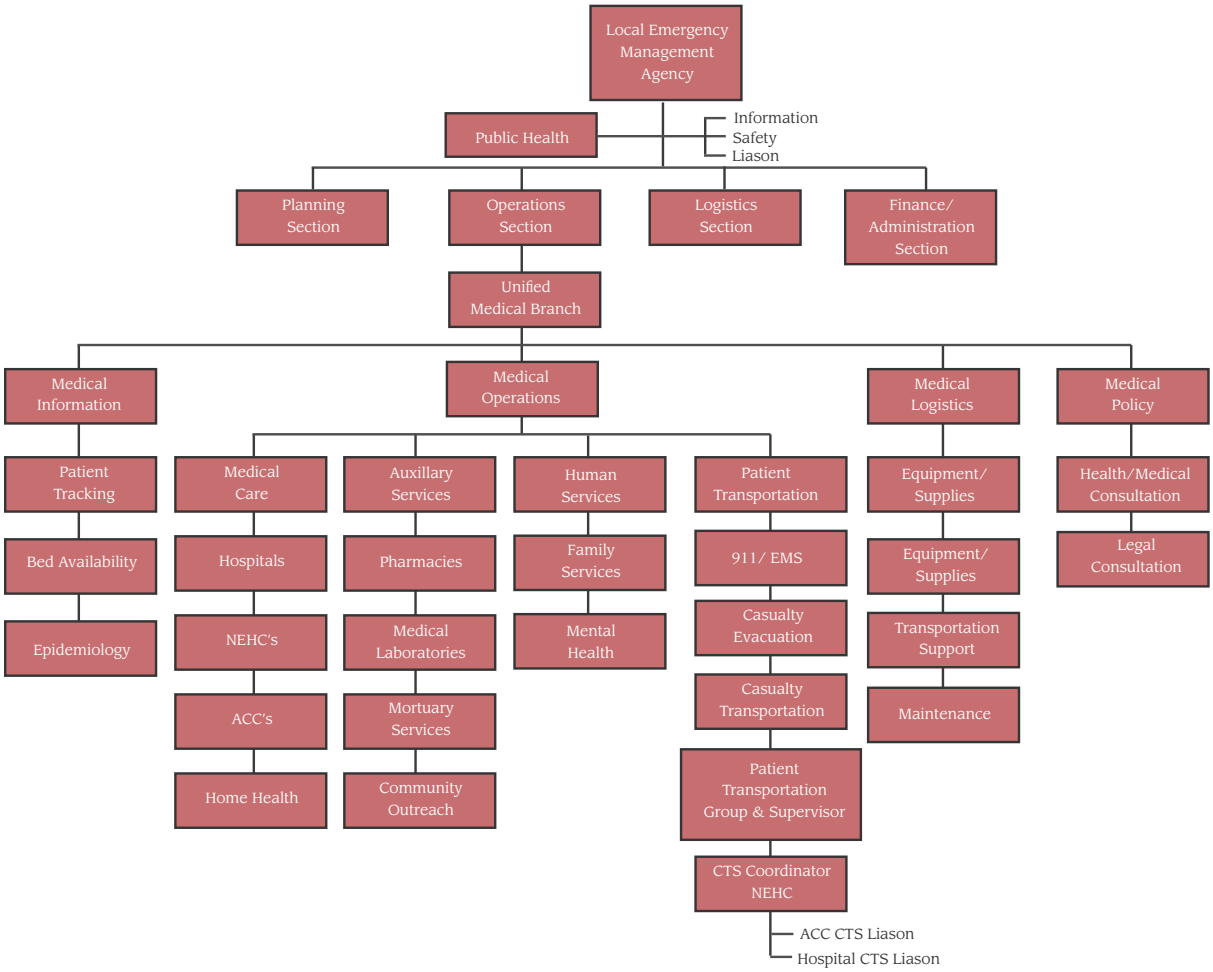

Figure 1. Conceptual Medical Command for a Biological Incident Response

Pre-identification of the site locations for triage and medication distribution centers (e.g., Neighborhood Emergency Help Center [NEHC]) and sites to provide expansion of the hospital system (e.g., Acute Care Center [ACC]) are necessary so that Casualty Transportation System (CTS) planners can identify primary and alternate routes between facilities before an incident occurs.

Promoting and establishing a uniform emergency communications system using existing communication links (e.g., taxi dispatch, and/or commercial patient transportation company) should be developed as part of the CTS and standardized where possible as part of a community's improved readiness posture. This effort should involve adoption of and subsequent training with interoperable communications equipment and standards that will ensure a smoother response to any disaster.

It is imperative that each jurisdiction, municipality, or office of emergency management (OEM), thoroughly coordinate, exercise and work all elements of the emergency plan to insure the greatest level of coordinated preparedness.

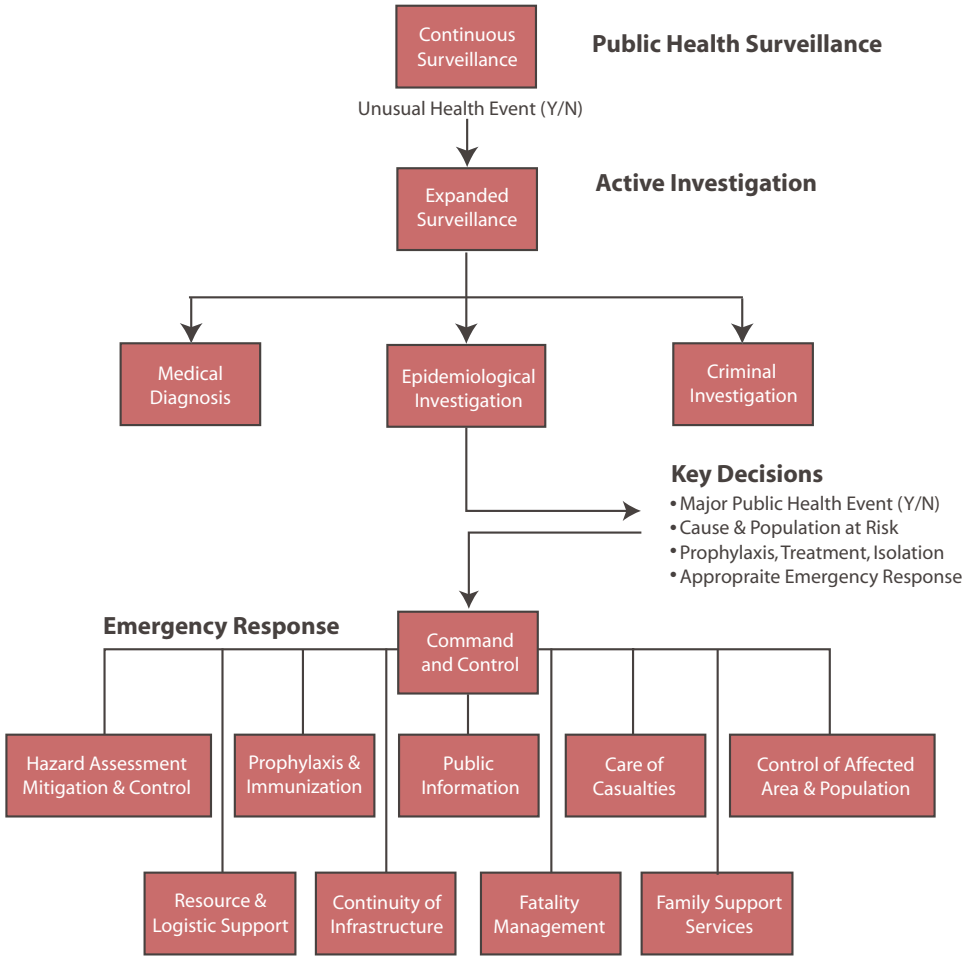

Figure 2. BW Response Template

The MEMS concept addresses the medical response needs that may result from a covert BW attack in which a non-communicable agent is released. Planners must consider the agent type to determine which methods are most suitable to their communities. Potential BW agents can be divided into two broad categories: communicable (transmitted person to person) and non-communicable. Fortunately, most of the common biological organisms are considered non-communicable. Some examples of non-communicable agents are Bacillus anthracis (anthrax) and Francisella tularensis (tularemia). Potential agents such as Variola (smallpox) and Yersinia pestis (plague) are easily spread person-to-person after the initial release and are considered communicable agents. Planners should consider the deleterious effects of bringing large groups of people together if the agent is communicable.

The MEMS is a model developed by a panel of medical and emergency management experts as an example of one way that a jurisdiction can expand its healthcare delivery capability in response to a biological terrorism event. The area hospital may provide some of the management and or elements of the medical staff to these modules, but this will likely be limited. Therefore, planning must assume that the bulk of the medical and support personnel will have to come from other non-local sources such as state or federal assets. The NEHC and ACC are each designed to have the capacity to care for up to 1000 patients per day.

Organization. A key guiding principle for development of the MEMS system is that success is more likely when existing medical infrastructure is used and expanded upon. The MEMS could be established during a catastrophic medical emergency by converting some pre-identified, existing clinics into functioning NEHCs.

Existing local medical systems may include public and private area hospitals, clinics, ancillary care organizations, and private physicians. These systems lack the "surge capacity" and the ability to expand that will be needed to respond to a biological terrorism event. MEMS components have been designed to maximize the utility and capacity of local medical system assets. Preplanned communication and coordination links between components and the application of additional resources will help to increase the healthcare system's surge capacity of a community.

Area hospitals typically form an emergency Medical Command Center (MCC) to coordinate hospital activities and sector health care operations during emergency responses.

The primary point of entry into the modular emergency medical system for symptomatic BW victims, as well as those who are asymptomatic, but potentially exposed, is designed to be the NEHC, not the local hospital.

The CTS will initially transfer stable, non-critical, non-BW hospital inpatients to hospitals located outside of the affected area to provide additional local hospital space and resources for incoming BW patients. Pre-existing mutual support agreements and integration of the National Disaster Medical system assets will facilitate these transfers.

ACCs are optimally located near the hospital and provide agent specific therapy and supportive care to severely ill BW patients that exceed hospital capacity. In this way the ACC serves as an extension of the existing facility

and is convenient to most hospital services. Area hospitals and associated medical care centers may be linked to the integrated ICS to form a community-wide MEMS (Figure 3).

In an alternate application of the MEMS concept, ACCs and NEHCs may be established as stand-alone units not associated with area hospitals.

Coordination of the NEHCs and ACCs may occur through either the Office of Emergency Management (OEM) and its Emergency Operations Center (EOC) or the Unified Medical Branch, which may be operated by the local medical/public health department. The MEMS can be flexibly applied depending on the severity of the situation and the resources available within the affected community. By pre-designating the participating medical organizations according to community sector and pre-selecting the locations for establishing ACCs, a community is better prepared to respond quickly and efficiently to a BW event.

Risk Management Policy

This document does not attempt to resolve terrorism response related legal issues, but highlights concerns that were identified while developing the MEMS concept.

Depending on the scope and magnitude of the event, health care practices will likely adjust to effectively provide care for the greatest number of casualties with available assets under emergency conditions. Decisions will need to be made to ration the use of the community's limited medical resources until significant mutual aid or federal resources arrive. In fact, it is estimated that significant federal resources will not begin to arrive until 24 to 36 hours after the request for aid has occurred. The affected locality must plan for this. Liability issues related to negligence and malpractice will likely have to be waived as clinicians will be asked to manage the high volumes of casualties and the standard of practice differs from standards to which clinicians and patients are accustomed.

Emergency officials will need to communicate with the medical community in advance (during planning activities) and, once the event is recognized, reassure health care workers that their safety and their family's has been planned for by providing prophylaxis and/or protection. 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 affected by an agent of biological terrorism.

In summary, the community's MEMS would provide a healthcare framework into which state and federal resources can be quickly integrated to expand and sustain local emergency health operations. The components of the MEMS are described in Figure 3.

Area Hospitals. Area hospitals serve as natural focal points for a community's medical response to mass casualty emergencies with the other medical system resources forming a network of support. During a catastrophic health event, hospitals will activate internal emergency response plans and form their own internal emergency-comand and control center. This element utilizes hospital staff administrators, department heads, and other key hospital personnel. In a mass casualty crisis, a hospital may recognize the need to focus on

two critical goals: maximizing capacity and optimizing efficiency.

Hospitals may achieve these critical goals by performing the following tasks:

1. *Implement the internal emergency response plan*

2. *Cancel elective surgeries.*

3. *Review status of current in-patients and consider discharge (if stable, with or without home health).*

4. *Provide a transition leadership team [Administrator, Medical Director (a deputy, acting or other similar title), Nursing Supervisor, and a pre-trained Logistics Coordinator] to implement the ACC.*

5. *Identify and submit specific support requirements to the MCC (i.e., personnel, equipment, supplies, financial, etc.).*

6. *Identify and submit physical security requirements to local law enforcement*

7. *Coordinate patient, resources, and information flow with MCC.*

8. *Establish a standard-of-care consistent with events.*

9. *Enhance Emergency Department (ED) capabilities through triage of lower acuity BW patients to alternative treatment facilities (i.e., NEHCs, etc).*

10. *Coordinate evacuation of patients with the CTS.*

11. *Provide patient education and self-help*

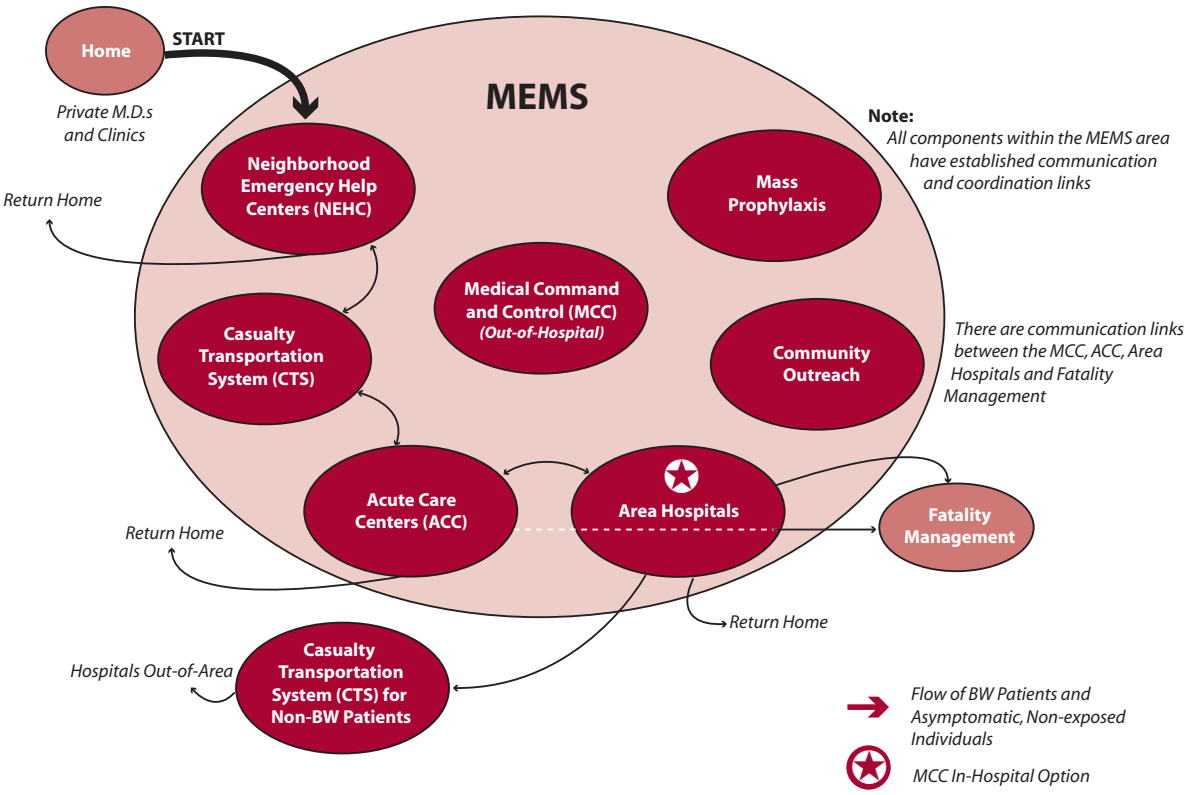

Figure 3. Modular Emergency Medical System (MEMS)

information briefings to discharging patients consistent with event information.

12. *Cooperate with incident investigation activities (patient interviews and other evidentiary gathering procedures).*

13. *Provide accommodations or assistance, as capable, for expanded mortuary service support activities.*

14. *Provide accommodations or assistance, as capable, for expanded social service, and victim assistance activities.*

15. *Actively coordinate all operations through the MCC to the UMB and the EOC.*

16. *Submit periodic requests to the MCC for resource re-supply (personnel, equipment, supplies).*

17. *Assist in tracking incident related medical supplies, equipment, and labor.*

18. *Assist in implementing stress management measures for patients and staff.*

19. *Issue prophylaxis to staff and their families.*

20. *Provide for staff family support.*

Unified Medical Branch (UMB)

Unified Medical Branch

In the Medical Command Organization for a Biological Incident Response (Figure 2), the UMB comes under the direction of the Operations Section Chief. However, the command and control of the medical response should be customized for local requirements. The primary goals of the UMB include:

1. Providing flexible, coordinated, and uninterrupted health response.
2. Facilitating standardization and interoperability of health care operations.
3. Ensuring optimum and efficient use of available resources.

UMB Response Tasks. The UMB has ultimate command and control of the MEMS. The UMB for a BW incident will consist of pre-designated hospital assets and officials. Each hospital may have an MCC, which controls the hospital and its supporting modules. The personnel in the MCC report directly to the UMB (Figure 4).

UMB tasks include:

1. Establish the regional UMB, as a component of the incident EOC.
2. Provide strategic MEMS staff planning, analysis, and forecasting.
3. Review and implement a regional cata strophic event health strategy.
4. Determine regional health response capabilities and identify potential resources (i.e., facilities, equipment, supplies, personnel), and anticipate shortfalls.
5. Coordinate activation, mobilization, resourcing, and set up of the MEMS components (i.e., MCCs, NEHCs, ACCs, and CTS).
6. Identify and submit specific response requirements (i.e., personnel, equipment, supply, financial) to the IC.
7. Determine information and reporting requirements and provide guidelines to participating institutions and MEMS components.
8. Ensure that the minimal standard of care is provided.
9. Coordinate credentialing, reception, and employment of responding health care providers.
10. Coordinate reception and distribution of relief equipment and supplies.
11. Provide operational command, control, and administration of assigned and attached medical response assets.
12. Provide technical consultation and advice on preventative medicine, epidemiology, stress control, sanitation, nuclear, biological, chemical, medical aspects, facility preparation, and finances.
13. Coordinate medical logistical support to assigned organizations.
14. Coordinate medical regulation and evacuation scheduling of patient movement to and between assigned medical facilities, as well as patient transfers to distant facilities.
15. Consolidate incident data, analyze data, and generate periodic situation reports.
16. Maintain current and projected operational status.
17. Evaluate the effectiveness of the health response efforts.
18. Advise the IC on all health related issues.
19. Integrate medical operations with medical diagnostic activity.
20. Integrate medical operations with incident investigation activity.
21. Integrate medical operations with Community Outreach activity.

22. Integrate medical operations with Family Support Services activity.
23. Integrate medical operations with Fatality Management activity.
24. Coordinate health briefings, health public service announcements/care instructions and other health risks communications.

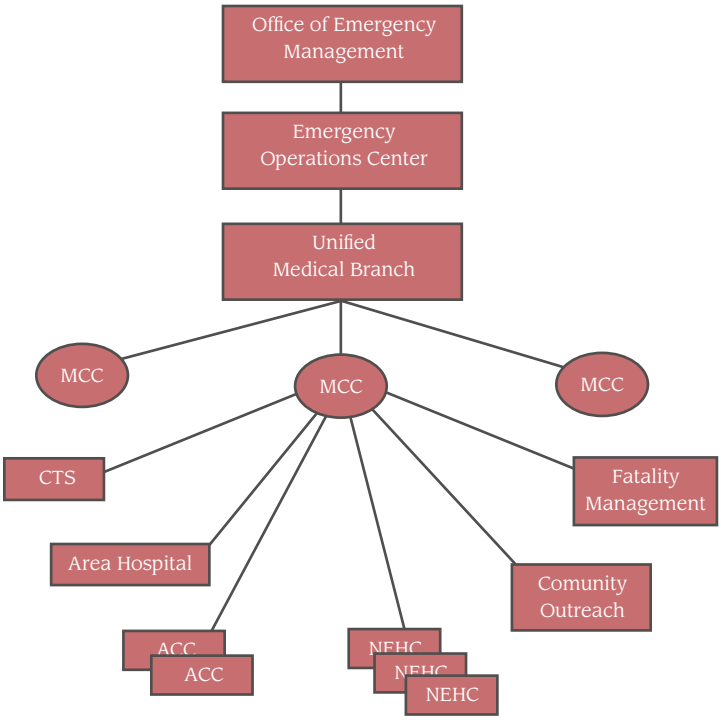

Figure 4. MEMS Chain of Command Structure

Medical Command and Control (MCC)

Medical Command and Control (MCC)

The MEMS command and control structure of a single hospital sector is the MCC. If multiple hospital sectors are affected by a BW incident, multiple MCCs will need to be incorporated under the UMB. The MCC, like the MEMS, is based on the nationally recognized ICS concept with similar characteristics of common terminology, functional organization, unified command structure, manageable span of control, comprehensive resource management, and integrated communications. Such a component is critical for the effective management of a mass casualty medical emergency.

Purpose

The purpose of the MEMS MCC is to provide command, control, administrative assistance, technical supervision, and consultation services in support of health and medical response operations during times of emergency or disaster conditions.

Special Considerations

Before beginning to identify a recommended approach to conducting MCC operations, four preparatory issues should be considered:

1. **Building on a Community's Existing Emergency Response Mechanisms.** Most jurisdictions already have existing emergency operation plans or disaster contingency plans in place. To be effective, the MEMS medical command and control component must be built on a community's existing emergency response mechanisms. Existing plans provide the structure by which the MEMS can be integrated. Although existing emergency plans may not specifically address all functions outlined by the MEMS concept, they can point to the appropriate authorities and task organization to execute such functions. By building the MEMS medical command structure that unites a community's existing emergency response resources and organizations, emergency planners may reduce resistance to the concept and avoid unnecessary duplication of past effort.

2. **Establishing a Well Thought-out Medical Command and Control (MCC).** Biological incidents can vary greatly in complexity, intensity, and magnitude. A major biological incident will almost certainly place overwhelming demands on any single jurisdiction's health and medical system. Any organized effort to care for incident casualties will require the immediate involvement of large numbers of local, state, and federal agencies. Implementing the MEMS response strategy will be a massive operation that crosses political boundaries and involves multiple functional authorities.

   Jurisdictions must work to establish a united health and medical command structure or community-based MCC. A united or unified command is a community-wide approach that allows all participating organizations or agencies with responsibilities for an incident response, either geographical or functional, to establish a common set of objectives and strategies to which all can subscribe. This approach also involves establishing a single lead individual to oversee and direct all health and medical

operations on behalf of the jurisdiction during emergency operations.

Unified command is not a new process. The United States Military has used a similar concept in integrating military services in joint operations for years. Implementing unified command is also consistent with FEMA's Guide for All-Hazard Emergency Operation Planning and is a fundamental principal of the ICS, both of which are widely accepted among the emergency management community. By establishing a MCC, which coordinates all health and medical resources, participating agencies/organizations increase the likelihood that the overall response and operational goals will be timely and cost-effective.

3. **Providing Necessary "Buy-in" Incentives.** Incentives, such as financial and legal, must be provided to establish necessary "buy-in" to the unified medical command approach and the MEMS concept at-large. Although the medical community may have the combined resources (including local, state, federal, public, and private organizations) to support the MEMS, they are not typically accustomed to functioning in partnership. In fact, day-to-day they may exist as business competitors. Unfortunately, this makes any efforts involving extensive pertinent collaboration difficult. Participating agencies/organizations may fear losing their competitive edge or abdicating agency authority, responsibility, or accountability.

   The development of managed care in the United States has recently placed constant pressure on healthcare systems to conserve resources and cut cost. Consequently, the number of hospitals and hospital beds has declined and the systems have lost their surge capacity. In most cases, present constraints on hospital revenues and the increases in medical expenses translate into an inability of these organizations to fund preparedness efforts. The government needs to develop special funding programs promoting medical preparedness initiatives that allow hospitals to actively participate in community-wide response operations. Local authorities need to work with MEMS stakeholders to identify funding requirements and to seek appropriate means of providing cost-sharing assistance.

4. **Establishing Jurisdiction and Authority.** A major biological incident is a public health disaster; however, the associated response can be managed in much the same way as other disaster relief efforts. In our country, local jurisdictions are expected to act first and lead efforts to protect people and property from emergencies and disasters. Depending on the nature and size of the event, state and federal governments may be called upon to provide assistance to local response efforts. Since local governments have the primary responsibility to respond, it is appropriate that they will also be responsible for planning, initiating, and coordinating an operation such as the MEMS.

   For contingency organizations such as the Unified Medical Branch and MCC to be effective, they must be empowered with real legal authority to perform or direct certain activities and actions on behalf of the jurisdiction they represent. This authority must include a limited

ability to influence pre-incident or preparedness activities and an expanded authority to act during emergency operations. Local jurisdictions should check their public health law for guidance.

Pre-Incident Action Examples

- Evaluating existing public health law and regulations.
- Recommending appropriate changes to local policies and legislation.
- Soliciting "buy-in" from key organizations, such as hospitals.
- Negotiating responsibilities among participating agencies/organizations.
- Building partnerships to provide necessary technical and logistical support.
- Assessing and documenting inventories of local medical resources.
- Sharing information among participating agencies and organizations.
- Seeking funds for planning activities, legal advice, training, and commitments of personnel, equipment, and facilities.
- Promoting MEMS related training and evaluation activities.
- Coordinating compatible communication systems and standardized procedures, reports and forms.
- Establishing financial cost-sharing arrangements with participating agencies.
- Establishing and authorizing system-wide protocols, policies, and procedures for all health and medical response activities

During an Emergency

- Providing strategic health and medical incident planning and analysis.
- Coordinating the activation, mobilization, and setup of health and medical response resources.
- Requesting additional resources in support of medical response operations.
- Coordinating reception, task organization, and integration of outside health and medical resources.
- Directing the allocation or sharing of resources among participating agencies.
- Implementing, revising, and authorizing system-wide protocols, policies, and procedures for all health and medical response activities.
- Establishing and maintaining a functional medical communication system.

Target Issues

Biological Incident Medical Command Organization. This command structure is based on both the principles of the ICS and unified command (Figure 4). Under this organization, the head of the Local Emergency Management Agency functions as the IC, overseeing all aspects of the multi-agency incident response. The ICS separates responsibilities into four well-defined sections:

1. Planning
2. Operations,
3. Logistics and
4. Administrative/Finance

Typically, the Operations Section contains a Medical Branch, which oversees incident related health and medical services. In our model, the ICS Medical Branch is re-named the UMB. Upon activation or declaration of a community-wide disaster, the responsibilities for coordinating and directing the health and medical services of the response are delegated to this authority. Likewise, the UMB assumes ultimate command and control responsibility of the MEMS on behalf of the community at-large. Alternatively, the biological incident medical command may be assigned under the local public health authority in charge of the incident with OEM in a supportive role.

Large operations involving multiple agencies and multiple jurisdictions, such as the MEMS, will require responsibilities to be further subdivided. In this model, duties are organized into four areas: Medical Information, Medical Operations, Medical Logistics, and Medical Policy. As the incident escalates and command requirements grow, additional levels of organization can be implemented.

It should be noted that the definition of this model was based on an examination of the ICS to determine how best to apply the principles of the ICS during a biological incident to manage the MEMS concept under a unified command organization.

Neighborhood Emergency Help Center (NEHC)

Introduction

The NEHC is one component of the MEMS response strategy. The NEHC is one approach to expanding the medical care system to handle mass casualties as the result of a biological terrorist attack. This section introduces key characteristics of the NEHC concept. A complete description of the NEHC concept is contained in the BWIRP technical report entitled NEHC Concept of Operations.

Purpose / Mission

The mission of the NEHC is to:

1. Direct casualties, especially non-critical and asymptomatic, potentially exposed patients, away from Emergency Departments (ED), allowing hospitals to continue to remain open in some capacity. Render basic medical evaluation and triage.

2. Provide limited treatment, including stabilization and distribution of prophylaxis, medication, self-help information, and instruction.

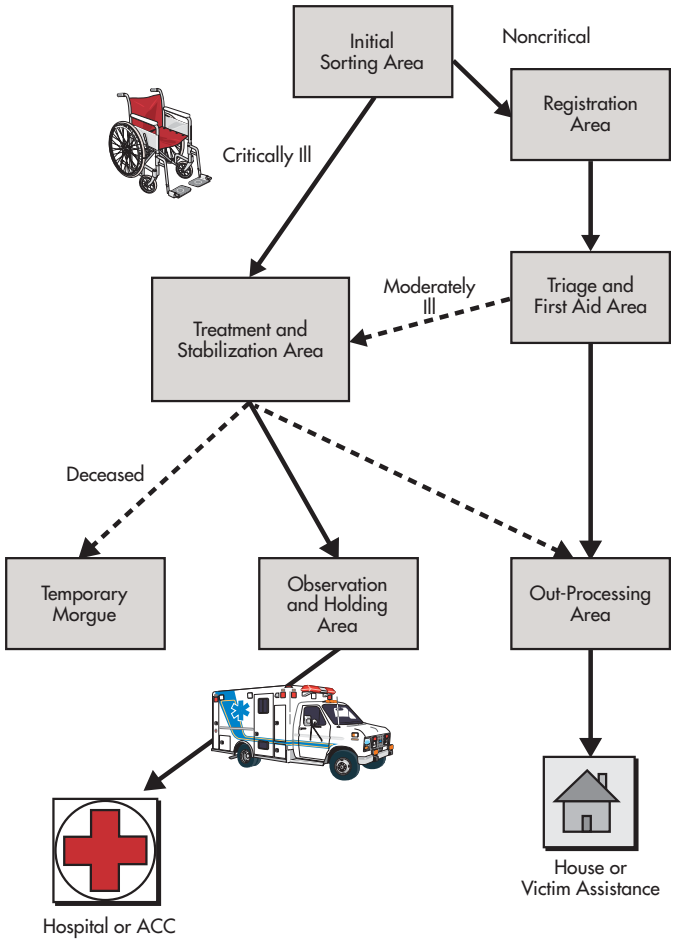

Figure 5. NEHC Operations Flow Diagram

Operations

The NEHC is divided into seven patient care areas or units (Figure 5):

Initial Sorting Area. This unit assesses patients, identifies those critically ill, and filters them to the Treatment and Stabilization Area. Non-critical patients are referred to the Registration Area.

Registration Area. This area initiates medical record keeping and victim tracking.

Triage and First Aid Area. This area continues triage and provides non-emergent first aid care.

Out-Processing Area. This area provides ample and expeditious clearing. It provides patient education and counseling and issues self-help information packets. It also distributes prophylaxis or treatment medications and collects patient records upon discharge.

Treatment and Stabilization Area. This area conducts rapid assessment and initial stabilization treatment to critically ill patients. Reasonable lifesaving interventions to stabilize patients for rehabilitation, transfer to a definitive care facility, or discharge home are provided at this point.

Observation and Holding Area. This unit continues care and monitors patients until they are cleared for discharge or are transported.

Temporary Morgue. This unit provides initial processing and temporary storage of remains until they are transferred to the appropriate mortuary services. This area records personal data of the fatalities, tags the remains, inventories personal effects, and arranges for transfer.

Concept of Operations

Casualties arrive at the NEHC primarily by their own means and are directed to the Initial Sorting Area, where they are assessed and sorted by triage personnel into two groups, non-ambulatory and ambulatory. All non-ambulatory, critically ill, and expectant patients are issued a control number and transported directly to the Treatment and Stabilization Area. This group may include pre-terminal or "expectant" patients. All other patients are issued a control number and directed to the NEHC's Registration Area.

Following registration, non-critical patients are reassessed and categorized at the Triage and First Aid Area. Patients receive a basic clinical assessment and first aid care, if needed.

IDENTIFICATION

- Patients not requiring care beyond prophylaxis and self-help information are directed to the Out-Processing Area. Patients sent to the Out-Processing Area are given an instructional briefing, issued prophylaxis, if indicated, and discharged. Discharge includes collection of patient records and referral to psychological counseling or other human relief services, as required.

- Patients identified as needing medical care beyond first aid during the Triage and First Aid phase, are re-categorized and forwarded to the Treatment and Stabilization Area.

As patients arrive at the Treatment and Stabilization Area, they are assessed, triaged, and rendered care in the order of priority. Once they have been stabilized within the available capabilities of the NEHC, they are transferred to the Observation and Holding Area for continued treatment. Patients considered unsalvageable (pre-terminal/expectant) are monitored and provided pain management. Deceased patients are pronounced dead and transferred to the Center's Temporary Morgue.

Patients requiring in-patient care are transported to either a hospital or an ACC by the CTS. Patients whose conditions allow discharge will be released from the Observation and Holding Area and directed to the Out-Processing Area.

Command Relationships

An NEHC Facility Administrator is responsible for the command and control of the NEHC. The Facility Administrator's role is to ensure that the mission of the NEHC is carried out as expeditiously and efficiently as possible. The Facility Administrator oversees the following sections within the NEHC. All command, control, and administrative activities of the NEHC occur in the Operations Center.

1. **Operations Section.** The Operations Section Chief manages all medical care and patient service providers. This individual oversees two operational branches, Medical Operations subsection and Ancillary Services subsection. A Medical Director oversees the Medical Operations subsection and directs the medical triage, treatment, and patient disposition for every patient entering the Center. An Ancillary Services Director manages the second subsection. This director is responsible for such activities as patient counseling, dispensingphar-maceuticals, and the temporary morgue.

2. **Planning/Records Section.** The Planning Section Chief is responsible for managing all paperwork that is generated within the NEHC. This section also maintains staffing logs identifying individuals working at the NEHC in any capacity and generates situation/status reports reflecting patient and staffing activity as dictated by the NEHC Facility Administrator.

3. **Logistics/Service Support Section.** The Logistics Section Chief is responsible for all the services and support needs, including obtaining and maintaining essential personnel, equipment, supplies, and ancillary services. The Logistics Section Chief is responsible for managing all personnel who are not assigned to the Operations and Planning Sections, including communications, internal transportation, family services, facility maintenance, and housekeeping personnel. An Internal Transportation Officer is assigned to assist the Logistics Section Chief in managing the internal transportation services personnel and to coordinate patient evacuation with the Casualty Transportation System (CTS) Coordinator.

4. **Other Staff.** A Community Liaison Officer, subordinate to the Facility Administrator, coordinates NEHC activities with the Community Outreach (CO) and public information efforts of the MCC. If staffing permits, a Security Officer should be assigned to manage the

personnel responsible for providing physical security and interaction with local law enforcement.

Resources

1. **Staffing.** A staff of 80 per shift composed of physicians, nurses, pre-hospital care providers, medical clerical personnel, and civilian volunteers are needed to operate a fully functioning NEHC. The local Office of Emergency Management (OEM) must provide and maintain a centralized registration and credentialing system to rapidly process all persons assigned to staff an NEHC.

2. **Facility Requirements.** The facility used by the NEHC must be a pre-existing structure that has adequate electricity, sewage systems, running water, and environmental control. Recommended buildings include: clinics, outpatient surgery centers, health clubs, community centers, schools, hotels, university infirmaries, large shopping centers, and malls. The NEHC must have a minimum of three doorways into the building; a main door for patients to enter, a door for discharging ambulatory patients, and a door approachable by vehicles for patients transferring via the CTS. A separate controlled staff entrance is recommended for security and safety. All doors through which patients may pass must be of sufficient size to accommodate wheeled stretchers and wheelchairs. Corridors should be of adequate width to allow the cross passage of two such conveyances without difficulty. Ideally, the building selected for the NEHC should accommodate all patient areas on the ground floor to facilitate patient flow. A site near public transit stops will also help to facilitate patient flow.

3. **Equipment and Supplies.** At least 72 hours worth of predetermined and locally stocked medical equipment and supplies are recommended when the NEHC is established. Stocks of necessary medical supplies, drugs and equipment must be on-hand at all times to sustain continuous NEHC operations.

Acute Care Center (ACC)

Overview

The ACC concept describes the specific command organization, operational execution, and the logistical and staffing requirements associated with the ACC. Additionally, this section addresses the philosophy of care and operational considerations that must be considered when implementing the ACC as part of the MEMS strategy.

The aftermath of a large-scale biological incident and its consequences on the fabric of society is almost unimaginable. Designing a health care delivery system to care for thousands or even hundreds of thousands of patients or victims when the local health care system is overwhelmed poses a daunting task for community or regional planners.

Purpose

The ACC is designed to treat BW patients who need inpatient treatment but do not require mechanical ventilation and those who are likely to die from an illness resulting from an agent of biological terrorism. Patients who require advanced life support (ALS) such as provided by intensive or critical care units will receive priority for hospital admission rather than admission to the ACC.

Restricting the type of patients treated at these centers serves two purposes. First, it allows a streamlined approach to patient care; as most patients will require similar treatment following pre-established critical pathways or clinical practice guidelines. Secondly, in situations where isolation is desirable but impractical, this plan cohorts patients with similar infections/exposures. This limits exposure to non-infected persons, a practice recommended by the Association for Professionals in Infection Control and Epidemiology Inc. (APIC) and the Centers for Disease Control and Prevention (CDC).

Assumptions

In developing the ACC concept, several considerations were made. The list that follows is specific to the ACC (as opposed to a biological terrorism event in general):

a. During a large-scale biological incident, the standard of care in an affected community will change to provide the most effective care to the largest number of patients. Advanced life-saving technology and treatment options will likely either not be available or unable to be implemented due to lack of equipment and/or specially trained medical personnel.

b. The expanded ACC facilities, as well as medical personnel and supplies, will be most efficient if directed to victims of biological terrorism-related illness only.

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

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

e. Physicians, nurses, and other licensed medical personnel who are non-local health

care providers (such as volunteers from out of affected jurisdiction or town), will need to be quickly credentialed following pre-established policies.

Level of Care Philosophy

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

The ACC is designed and equipped to provide mass care only to patients of a biological terrorism-related illness who require inpatient treatment. When implemented, ACCs will concentrate on providing agent-specific and ongoing supportive care therapy (i.e., antibiotic therapy, hydration, bronchodilators, and pain management), while hospitals focus on the treatment of critically ill patients. The ACC, therefore, will not have the capability to provide advanced airway management (i.e., intubation and ventilator support), Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS), Advanced Trauma Life Support (ATLS), or Neonatal Advanced Life Support (NALS). The ACC is designed to create an environment in which patients who are going to respond to agent specific treatment can do so.

Standing Admission Orders

Standing Admission Orders may be briefly defined as "Prepared instructions for patient management that are to be followed (usually by nursing staff) on a regular and consistent basis, unless instructed to the contrary". Therefore, to facilitate the rapid admission and treatment of casualties, predefined and preprinted standing admission orders should be used.

Command Organization

The organization of the command and control structure for the ACC will be locally determined and will fit into the existing local emergency command structure. The example in Figure 4 (MEMS Chain of Command Structure) is modeled after the nationally recognized ICS and the companion Hospital Emergency Incident Command System (HEICS).

Patient Flow

Casualties will arrive at the ACC primarily via casualty transportation services or ambulances. The MCC of the MEMS will determine where the patients will be admitted (hospital or ACC) and communicate that location back to the casualty transportation services staff. The MCC will also communicate to the ACC that there are incoming patients.

Pre-established criteria to guide transfer and discharge decisions are useful to promote patient movement through the system. This approach assists the ACC in maintaining maximum bed availability for continued admissions of BW victims.

Facility Requirements

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

ACC Planning

- Site selection
  - Parking and access
  - Near public transportation
- Building considerations
  - Total space and layout
  - Recommended buildings
  - Doorways and corridors
  - Electrical supply
  - Heating and air conditioning
  - Lighting
  - Floor coverings
  - Hand wash facilities
  - Refrigeration capabilities
  - Ventilation
  - Sanitation capabilities (including toilets, showers, hot water and laun dry)
  - Communications (telephones and PA system)
  - Food service capability.

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

1. **General Layout -** The nursing subunits should be centrally located to the other areas of the ACC.

2. **Traffic Pattern (Patient and Supplies) -** The ACC layout should allow rapid access to every area with a minimum of cross-traffic.

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

4. **Provisions for Medical Gases (Oxygen) -** Each community should evaluate its resources to determine whether to provide oxygen therapy in the ACC due to the logistical complexity and expense of this resource. It is strongly suggested that a biomedical engineer be involved in the setup of the oxygen delivery system.

Staffing Requirements

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

Furthermore, planning should include communicating medical staffing shortfalls through local OEM and public health agencies to the State Emergency Management Agency (EMA), who will address this by utilizing State resources, mutual aid resources, and by requesting federal support. As the lead agency under Federal Respnse Plan (FRP) Emergency Support Function (ESF) #8, the Department of Health and Human Services (DHHS) is responsible for providing federal health and medical care assistance to localities impacted by natural and technical disasters as well as the consequences of terrorist attacks. To better prepare localities for dealing with WMD terrorism, DHHS and the Office of Emergency Preparedness (OEP) is heading up a national effort to assist in enhancing the capabilities of select communities to respond to WMD medical consequences by developing local

Metropolitan Medical Response Systems (MMRS).

Staffing an ACC is a major challenge; in practical application, it may be that an ACC cannot be opened until outside staffing resources arrive. Staffing may need to include non-traditional providers such as medical students, dentists, veterinarians, chiropractors, and podiatrists.

The ACC consists of 1000 beds divided into 250 bed pods that are further divided into five 50-bed subunits. The ACC will likely operate on two rotating 12-hour shifts. A key issue is how to staff the NEHC and ACC functions. These will be labor intensive, and federal staffing resources will not be immediately available. As part of the planning process, creative sources of qualified personnel to staff the NEHCs and ACCs must be considered. Suggested minimum staffing per 12-hour shift for a 50-bed nursing subunit follows:

- One physician
- One physician's assistant (PA) or nurse practitioner (NP) (physician extenders)
- Six registered nurses (RNs) or a mix of RNs and licensed practical nurses (LPN)
- Four nursing assistants/nursing support technicians
- Two medical clerks (unit secretaries)
- One respiratory therapist (RT)
- One case manager
- One social worker
- Two housekeepers
- Two patient transporters

Operational Considerations

There are a number of operational considerations to examine and incorporate into ACC planning activities. More detailed information on each one can be found in the ACC Pamphlet or Concept of Operations for an Acute Care Center.

- Extemporaneous Training
- Job Action Sheets
- Patient Records
- Patient Tracking
- Medical Equipment and Supplies
- Pharmacological and Therapeutic
- Drugs and Agents
- Environmental Health and Sanitation (Housekeeping)
- Personnel Protection Measures
- Provisions for Children and Family Members
- Staff Support Services
- Epidemiological and Public Health Investigation
- Patient Disposition
- Food Services
- Hospice Care

Self-Sufficiency

Communities should expect to be self-sufficient for up to 72 hours following an attack. In addition, some supplies maybe available via FEMA, the FRP and the CDC's National Pharmaceutical Stockpile Program. More information is available via the Web sites; www.fema.gov, http://www.fema.gov/r-n-r/frp/ and www.cdc.gov.

Community Outreach (CO)

Overview

The purpose of the Community Outreach effort, in the context of the MEMS, is to disseminate information related to the incident, assess the affected community/area, and conduct mass prophylaxis if indicated. A secondary purpose of CO in some situations may be to provide some form of patient care beyond mass prophylaxis such as patient assessment and triage.

As traditional non-medical buildings are converted into treatment facilities such as NEHCs and ACCs, this information needs to be communicated to the community. Community outreach may simply be a vehicle for disseminating information. In planning, the Community Outreach component must be structured so that it can either be an intense effort lasting for a few days, or a more extended one lasting several weeks. We have attempted to create a framework in this pamphlet that is flexible enough for many different scenarios.

Possible Methods for CO

Possible Methods for CO:

- Use of the Media
- Reverse 911 Calls
- Establish an 800 number
- Flyer Distribution
- Faxed Notices
- Public Briefings
- Information Booths
- Use Community Organizations
- Door-to-Door Canvassing
- Ask Citizens to Call in

Methods

There are many ways for a locality to conduct a community outreach effort. Many of the options are not appropriate for every situation or for every municipality. Each locality will need to determine which method, or combination of methods, would be the most appropriate for their situation.

Door-to-door canvassing is the most labor intensive but also the most thorough method of reaching people. By physically going to every door, one will know exactly who received the message and who did not. It also allows more detailed information to be obtained such as exactly who and how many people reside at each address, and of those, who is sick versus who is well.

Door-to-Door Canvassing

Considerations for Door-to-Door Canvassing:

- Visit every household or select certain neighborhoods to visit?
- What is to occur at each home?
- How long should each visit take?
- How long will it take to travel between homes?
- What should be done if no one answers the door?
- Security for canvassing teams.

Planners should consider the exact mission(s) that they want to assign to the outreach effort. Whether or not the agent is communicable will help determine what the mission will be. The community outreach effort may require CO workers to distribute information,

collect information on the perceived target population, distribute prophylaxis, triage patients, or determine the transportation requirements to move patients, especially those who could not access the NEHC, throughout the MEMS system. Most likely it will be a combination of several missions.

The geographic, cultural, and social make-up of the community will greatly effect how the outreach program will operate and how many resources will be required.

- Is the affected area a large community with high-rise apartment buildings or a suburban area consisting of single-family homes? It would be easier to canvass a single apartment building than one hudred individual houses.
- Does the community have a large transient population? This may mean that the affected population is more dispersed that one would normally expect.
- Does the community have a large mix of ethnic groups or populations who do not speak English? How will the information reach people who cannot read or understand English?

Time is the final determinant. Depending on the agent, the incident may last a few days to several weeks. For a community outreach effort to be effective, the response must be assembled and executed quickly. The effort must be able to contact all of the people in the target population within 72 hours or the outreach effort will lose its effectiveness as the event either escalates out of control or rapidly winds down.

Sectoring

The management of a citywide community outreach effort is a difficult task. Sectoring is a way to divide the affected area into smaller portions so the task of an outreach program will become a manageable operation.

The choice of how to sector the community would likely be based upon how large the locality is and who would do the canvassing. For example, if a community chooses to use off duty firefighters, a logical sectoring method would be to use fireboxes because firefighters are already familiar with them. However, very few people outside of the fire department are familiar with fireboxes, so if the canvassing teams do not include firefighters another method would be more effective.

Emergency planners should consider using well defined, existing boundaries to eliminate confusion. They should consider any natural boundaries (e.g., rivers, highways, etc.) that may exist and hinder the process. Some sectoring methods considered natural boundaries when they were created, while others did not. Police districts and fireboxes usually do not cross these boundaries while school districts and zip codes usually do so. Also consider how well defined the neighborhoods are in the community. Some communities have extremely well defined neighborhoods while others do not. Of the methods listed above, fireboxes, voting precincts, and postal routes would probably be the most effective for use in a biological terrorism event. In such an event, sectoring by hot zone would be the least helpful because it will be very hard to establish the point of release and even harder to define its perimeter. This type of sectoring would be more helpful for a chemical or explosive type event.

Regardless of how the community is sectored, always put someone in charge of

each sector to manage the canvass teams operating within it.

Resources

Depending upon the mission given to the CO effort, a large number of people may be needed to perform the assigned tasks. There are many sources of personnel and most localities have the ability to obtain an adequate number of people, if they plan appropriately. Who should perform community outreach? When selecting who would conduct the CO efforts, start with personnel from uniformed organizations sworn to complete their duties. Uniforms command a level of respect and are readily identifiable by the community. Uniformed personnel provide a high level of reliability and dedication to complete the task at hand beyond what is normally expected of the general volunteer population. People in this category include off-duty police officers, police officers from neighboring jurisdictions, state police (especially from other parts of the state), the National Guard, off-duty firefighters, etc. Police and firefighters from the affected community will probably already be tasked to perform other functions in the response (e.g., security, crowd control, etc.) and would not necessarily be available or expected to perform community outreach.

There are other creative ways to find the personnel to perform CO. For example, increasing the shift from eight hours to twelve hours for public employees such as police officers, firefighters or other personnel would provide access to additional personnel.

Planners should arrange in advance to get assistance from other jurisdictions through mutual aid agreements. Most jurisdictions have mutual aid agreements in place with their neighboring communities, however a biological event is likely to cross the jurisdictional boundaries of most municipalities. Therefore, planners may consider establishing mutual aid agreements with distant jurisdictions that are not normally considered as sources for mutual aid.

Tracking and Documentation

Tracking and documentation are critical tasks for the community outreach effort. Methods to document every person and household contacted, the data collected, and who still needs further follow up should be identified in advance.

Mass Prophylaxis (MP)

The key to decreasing the impact of a biological terrorism event is to provide antibiotics as soon as possible to those affected. With some agents (e.g., B. anthracis), providing prophylactic medications is the key, even before the person begins to show any clinical symptoms. A biological terrorism attack has the potential of infecting thousands to tens of thousands of people. It is likely that the total number of infected will be unknown, so it is important for a community to plan for acquiring and distributing large quantities of prophylactic medications.

A key piece to address in any mass prophylaxis plan is who has priority to receive medications. It is commonly agreed that the first people to receive prophylaxis should be the first responders and the community's key medical and support personnel. It is important to get the prophylaxis to those key personnel so they will be able to do their job during the event. This information should be communicated to the public prior to any event, to increase the likelihood that people understand the reasoning behind such decisions. Proper planning and early incorporation of those decisions into the community's emergency operations plan (EOP) will minimize the turmoil later. These plans should be coordinated with State plans for the receipt of these pharmaceuticals.

Very few communities have enough antibiotics currently available to them for mass prophylaxis programs. For this reason, the Centers for Disease Control and Prevention (CDC) has developed a cache of medications and medical supplies specifically for use during a chemical or biological terrorist attack. This cache is known as the National Pharmaceutical Stockpile (NPS). The CDC can deliver the stockpile to any community in the continental US within 12 hours of the request. States and communities should incorporate requesting, acquiring and distributing the stockpile into their emergency operations plan. The most important consideration that planners must address is that the NPS arrives in many large cargo containers, which require breakdown, repackaging and distributing and is the responsibility of the receiving community. The CDC resource, the Planning Guide for Receiving, Organizing, Repackaging, and Distributing the CDC National Pharmaceutical Stockpile is available upon request.

The following should be considered when States write plans to address the request, receipt and repackaging and distributing of the NPS:

1. Official responsible to accept receipt of the NPS (and backup designees)
2. Appropriate health care practitioner to receive the controlled substance portion of the NPS, if applicable.
3. Choice of airfield
4. Cargo handling equipment
5. Facility for breakdown and repackaging of the NPS
6. Storage and security of the NPS
7. Repackaging of NPS, in particular the prophylactic medications
8. Tracking of the NPS assets
9. Trucks and personnel to move supplies from the airfield to distributing/dispensing sites

There are several methods for the breakdown of the NPS. In brief, they are:

1. Breakdown the entire NPS at the airfield,

and move the smaller, repackaged supplies to the distribution sites.

2. Move the NPS in bulk to the distribution sites and commence repackaging activities at each location or at a location central to most of the distribution centers.

3. Break down cargo containers at the airfield and repackage a portion at the airfield and the remainder closer to the site of the incident. The medication repackaged at the airfield is provided to first responders. The medication delivered in bulk to the local distribution site is repackaged for the general population.

4. Repackage the NPS at a site closer to the area's population center.

5. Dispense oral drugs through local pharmacies equipped to repackage into individual treatment courses.

6. Repackage NPS oral medications using the facilities of a local mail out/online pharmacy.

7. Use one of the seven Consolidated Mail Outpatient Pharmacies (CMOP) of the Department of Veterans Affairs (VA) to conduct repackaging of the pharmaceutical portion.

In order to conduct a mass prophylaxis effort, a decision must be made regarding the breakdown and distribution approach to be used for the target population. Depending on the type of incident and how much information is available to the regional officials, prophylactic treatment may be appropriate for all of the population in the affected area, or for only a subset of it. Further, the dosage distributed (e.g. a 3 day supply or more) will also affect the number of persons treated. These decisions are the domain of the local health officials.

In the MEMS construct, mass prophylaxis programs should complement the NEHC's treatment and prophylaxis distribution efforts. Community Outreach can augment any mass prophylaxis program beyond what the NEHC can provide and to affected individuals who could not visit an NEHC. The previously described community outreach resources can be applied to mass prophylaxis efforts. Provisions must be made to obtain and document patient consent to receive treatment. Documentation requirements will be similar for mass prophylaxis as for other community outreach activities and must minimally include:

- Name
- Address (including zip code)
- Allergies
- Gender
- Age
- Whether or not individual is symptomatic

If the distribution method involves having the public go to a community location to receive medications, security at each site will be necessary, particularly if there is any measure of panic.

In areas of multi-ethnicity, interpretative services will be required. This includes persons who can interpret verbal as well as printed material. At the dispensing site locations, this will be particularly important for screening (consent and allergies) and self-care instruction.

If the NEHC concept is not adopted, then each mass prophylaxis site should consider the advantages of sorting people upon arrival based on whether they are exhibiting symptoms or not. This may be especially applicable in situations where the agent has not yet been positively identified and the possibility exists that it could be communicable. While plague and smallpox are the usual communicable diseases discussed in the context of biological incidents, both may be difficult to identify prior to executing a mass prophylaxis effort, and therefore, separating the symptomatic from the non-symptomatic holds merit. However, the asymptomatic group may include incubating cases.

Finally, in multi-jurisdictional communities, cooperative planning is essential in executing effective community outreach and mass prophylaxis programs. Many people live in one jurisdiction and work in another. For this reason, mutual advance planning and field-testing is strongly encouraged.

Casualty Transportation System (CTS)

Introduction

The intention of the CTS is to address casualty transportation issues based on the MEMS construct. This strategy initially moves non-BW affected patients out of the involved community. This effort will be coordinated with receiving facilities and possibly the federal government especially the National Disaster Medical System (NDMS). The second very crucial part of the strategy is to activate a CTS to provide transportation for patients throughout the MEMS. This transportation system will have the capability to transport a large number of patients between MEMS patient care facilities.

NOTE: Although CTS services transport all victims of a BW incident; fatality management is beyond the scope of this document and therefore will not be discussed herein.

Key Aspects of the CTS

- Provides transportation for patients throughout a modular alternative health care system.
- Assists the community in transporting non-critical BW affected patients out of the community to free bed space in local hospitals.

Purpose/Mission

The CTS has two purposes.

1. Provide prompt coordinated transportation service of patients within the MEMS by maintaining efficient movement of patients between all levels of care.

2. Provide medical transport services for non-critical/non-suspected BW patients from local medical facilities to collection points/ facilities. The implementation of the NDMS model will assist in moving patients from the collection points (normally at airports) to distant hospitals outside the affected area.

Assumptions

The CTS concept is predicated on the following assumptions.

1. The current EMS system will be overwhelmed and unavailable to transport additional patients throughout the MEMS patient care facilities.

2. The current EMS system will transport the critically ill patients from their homes to the hospitals or the ACCs depending on bed availability.

3. The NEHC is situated near a public bus route so that non-critical patients with out private transportation will be able to use the public transport system to get to the NEHCs.

4. There will not be enough pre-hospital care providers to staff the CTS and supervisory personnel will allocate personnel resources to meet transport requirements and priorities. The ALS providers will staff the jurisdictions EMS units.

5. The federal Emergency Medical Treatment and Active Labor Act (EMTALA)/

Consolidated Omnibus Budget Reconciliation Act (COBRA) or "Anti dumping laws" will likely be waived and not apply to the CTS during a bioterrorist event.

Command Relationships

The organization of the CTS uses a systematic approach for command and control. The command of the CTS is integrated directly into the Operations Sector of the ICS/IMS. Within the Operations Sector, there is a Patient Transportation Group Section, which will command the CTS (Figure 1). The concept places the "headquarters" of the CTS at the NEHC because 90% of transports will originate from the NEHC. This gives the CTS a centralized command with a single locale based in the NEHC; however, the CTS should have decentralized operations with many different components.

Three command personnel are critical to the CTS. Their positions and roles are as follows:

1. **CTS Transportation Group Supervisor:** This supervisor, located in the EOC of the community has many operational functions inclusive of the CTS. The Trans portation Group Supervisor will centrally control all CTS vehicles in the various sectors/neighborhoods where the NEHCs are located throughout the community. The CTS Group Supervisor should have communication links with fire, police, EMS, and mutual aid links with neighboring fire, police, and EMS at the EOC.

2. **Casualty Transportation System Coordinator:** At the NEHC, the CTS Coordinator will assign transportation routes and notify vehicle drivers of routine patient transportation requests known as calls (Note: This is not a 911 or EMS call). The Coordinator acts as a sector officer and a coordinator of all activities of the CTS. When a vehicle is low on fuel or having mechanical difficulties the CTS staff will contact the CTS Coordinator for management decisions.

3. **Casualty Transportation System Liaisons:** The liaisons, located in the ACC and hospitals are the primary contact for CTS (Figure 1). These liaisons will assist in directing CTS personnel in emergent issues and re-routes. The CTS Liaisons will also function in other roles under the operations/transportation sector. If vehicles or staff run into problems, they will communicate directly either back to their CTS Coordinator or to the CTS Liaison at their drop facility, who will instruct them on further actions. The CTS Liaison will contact the CTS Coordinator and update them on the issue.

Operations

In the early stages of the crisis, hospitals will be unable to handle the constant surge of patients arriving at their facilities. The MEMS and CTS concepts recommend that jurisdictions move non-critical, non-BW affected patients to other locales outside of the affected area. Once implemented, the CTS could assist in the process or accomplish this on its own. This redistribution of patients will initially enable each hospital in the community to create bed-space for the increased number of BW patients waiting to be admitted. However, even this effort will not be sufficient, because hospitals will eventually reach full capacity again and unable to accept any new patients (BW or non-BW). As Emergency Managers activate the MEMS, the NEHC, ACC, and CTS will

standup simultaneously as a part of that process.

On the first few days of operation, routes are scheduled as demand necessitates. After the first 48 hours, the Transportation Coordinator will monitor trends to determine if the CTS can begin a scheduled routing system. In this system, buses make stops at each of the facilities, and back again. If time and resources permit, the buses could pick up and drop off discharged patients from the ACC to public transit stops. Another routing addition is to shuttle patients to and from parking lots to the NEHC.

When the CTS becomes operational, drivers and staff will report to a pre-established staging area where they will receive a quick briefing of the incident, highlighting important infection control and awareness issues and procedures. They will also receive an information packet on how to protect themselves and their passengers from contracting the agent, how and what information to communicate and not to communicate to patients, and other necessary operational information. The Group Transportation Supervisor will provide personal protective gear along with prophylaxis, if needed, as CTS staff arrive at their duty station.

After reporting to the staging area, drivers and vehicles will be directed to report to their assigned NEHC. Upon arrival at the NEHC, drivers will receive their patient transportation assignments via radio dispatch or through written communication.

Private citizen vehicles may be used if public resources are completely depleted. Minivans, pick-up trucks, flat bed trucks, or any type of four-door car could transport wheelchair patients to the ACCs. Transportation of victims by private citizens should be avoided since instant background checks on each individual will not be possible. However, if a family member transported the patient initially, they may continue. Taxi services, limousine services, or mutual aid commercial ambulances/transport systems are the next best options if commercial wheel chair accessible vehicles are not available.

Initial Vehicles for the CTS

Initial vehicles needed for the CTS (per Hospital and its associated NEHCs and ACCs):

- One vehicle equipped to carry one recumbent patient (such as an ambulance)
- One vehicle that can carry thirty non-recumbent patients (such as a bus)
- Two non-recumbent/wheel chair bound passenger vehicles (such as ambulettes or wheelchair accessible vans)

Planning Considerations

Pre-planning is very important for the operation phase of the CTS. Without the development of written plans prior to an incident, Emergency Managers cannot easily coordinate or manage the operation of the CTS during a BW event. Written interagency and mutual aid agreements and Memorandums of Understanding with all agencies involved should be in place before an incident occurs. Operational plans for the required transportation systems need to be developed. Each system needs to know what

to do and how they will need to operate during the crisis. Pre-identification of the locations of the NEHC and ACC facilities are necessary so that CTS planners can identify primary and alternate routes between facilities ahead of time. A communication link to an existing communication system (e.g., taxi dispatch, and/or commercial patient transportation company) should also be pre-established.

Resources

1. **Staffing.** The potential for a catastrophic number of patients entering the community's health care system could cause the community's emergency medical response system to recall all of its emergency responders. This will quickly result in a shortage of available skilled providers and therefore, the CTS cannot rely on a single transportation system for staffing. The existing agencies that are providing personnel to the CTS will predetermine staffing patterns for the CTS and coordinate this information with the Transportation Group Supervisor.

   Many commercial ambulance personnel will not be available to work, as many of them are also first responders in the community or may be victims themselves. Personnel available to staff the CTS may not be trained to administer medical care during transport. Hence, the CTS concept does not require that CTS personnel administer medical care while transporting patients. Ideally, drivers of patient transport vehicles should have Emergency Vehicle Operator Certified (EVOC) qualifications. All vehicles will require at least a driver and an assistant.

2. **Facilities.** It is recommended that the community use the facilities of the agencies supplying vehicles to house, maintain, refuel, and dispatch the fleet of vehicles. These pre-established businesses do not require any additional resources. Vehicles could return to these locations for refueling, maintenance, and decontamination. Staff could pick up vehicles as they report into work and take the vehicles to the staging areas.

3. **Vehicles/Transportation Systems.** Possible Transport Vehicles for the CTS:

   - Airport shuttle buses
   - Government vehicles
   - Private ambulance vehicles
   - Para-transit vehicles (vans or small buses equipped for handling wheel chair passengers)
   - Rental vehicles
   - Military vehicles
   - Local Fire/police/EMS vehicles
   - Golf carts (for limited distances)
   - Helicopters (for longer distances)

   Emergency Managers might have to consider using alternative transportation systems other than commercial ambulance providers. Local municipal transportation authorities, department of public works, local military transportation authorities, taxi companies, and independent bus companies all have personnel, vehicles, and facilities needed to operate the CTS. The use of school buses is not recommended, as the public may not allow children back onto a vehicle that carried potentially contaminated patients, even if it has been thoroughly decontaminated. The community should also avoid using private citizen's vehicles to transport patients. The only exception is if the

person who initially drove the patient to a facility wants to transport that patient to the receiving facility and the patient is willing to travel with them.

Discussion

A BW incident is very different from any other type of disaster a community could face. Devastating numbers of victims could turn up at hospitals seeking care. Initially, hospitals should attempt to transport non-critical patients out of the area to other jurisdictions not affected by the incident. This will initially alleviate the burden felt by the hospitals. However, implementation of other strategies to care for the victims will be necessary. A modular medical system to care for these victims could assist the community in managing the crisis. The MEMS relies heavily on the transportation of its patients throughout its facilities. Transporting and maintaining efficient coordinated movement of patients between facilities within the MEMS is the objective of the CTS.

Emergency planners should integrate the CTS into the community's mass evacuation and emergency transportation plans. Although it should be a separate entity from the current EMS system, it may augment that system if there are enough resources. The community's current private patient transportation systems, along with their public transportation systems, should operate the CTS. The CTS is designed to integrate directly into the ICS/IMS under the operations sector, within the Patient Transportation Group for Command and Control. Planning to pre-establish and pre-designate units, staffing, facilities, and resources is very important for the CTS to function adequately.

Public Information (PI)

Introduction. An act of biological terrorism is designed to generate significant amounts of public fear and apprehension that leave lasting impressions on victims and the population at large. It is the media's goals to monitor what's happening around the community and to inform the public of any newsworthy occurrences. Any terrorist incident, be it biological, chemical or explosive in nature, will be a major news story, as was seen in the September 11 World Trade Center (WTC) and Pentagon attacks. These types of stories result in a considerably strong public demand for accurate and timely information about the incident. It has been shown that public uncertainty and a lack of information will shape the public's reaction and memory to a terrorist or disaster event. It seems self-evident that the media can play a significant role in shaping the public's impressions of an event due to its role as the principal conduit of public information. The news media operates on a public mission in terms of purpose and franchise. This helps to distinguish journalism media from other forms of media expression. However, this distinction has become increasingly difficult to distinguish as the differences between the two have become blurred. Jurisdictions and community emergency planners need to look at ways in which various organization plans address the role of the media. Shortfalls in this area need to be addressed and exercised before an actual emergency.

Definition and Purpose. Taken in the context of a bioterrorist incident, Public Information is information that the public uses to ensure safety within the community. It is information that people will use to make decisions and take actions that affect the protection of their lives, property, and the environment in which they live. Therefore from an emergency management perspective the purpose of public information and the media in particular, is to convey key information to the affected community that will mitigate public panic, prepare the public for action, alert or warn the public, protect property, minimize environmental impact, save lives, and convince the public that the government has control of the situation (all of which were displayed during the days after the WTC and Pentagon attacks). Understanding these media functions and how each response organization has a vested responsibility to itself and the public may assist in the proactive planning collaboration.

Proactive Action. It is essential to develop a plan to effectively utilize the media to educate the public and enhance the effectiveness of the response. Consideration needs to be given to developing communications strategies that bring the media into a partnership with consequence managers before the disaster. Bioterrorism plans and training exercises should be developed to anticipate and address public information issues that the community, the media and emergency management agencies may face. This should include a detailed plan for educating the public on what to do in such an event. This plan should be implemented during the mitigation phase of emergency response. The Internet or other routes of information dissemination will also be used to provide information to the public. The best chance of achieving the goals of mitigation and effective response is to enter into a partnership with the public during "normal" times. This effort may be greatly facilitated by the media via public information announcements. Without adequate

planning, reactive responses are normally ill prepared or inaccurate, insensitive to the public's needs/concerns, do not reduce fears or engender trust, and may leave the public with a negative feeling about the information that is released (i.e., they are hiding something).

Rumor Control. With many dead and many more sick, fear will set in quickly. There must be a constant and consistent media campaign to get information to the public. Citizens must receive rapid information on where to go for treatment and to locate loved ones, and how they are to respond when symptoms occur. Public health and safety information must be fully coordinated and issued "with one voice" so as not to confuse the public. This approach is equally important for the response community that must have accurate up-to-date information to deal with the public. The media can be a valuable asset if effectively brought onboard. Ideally, the media will be given frequent information updates (as displayed by New York City's Mayor Rudy Guiliani during the September 11 crisis) and have their questions answered as honestly and completely as is possible to do. Blame-assignment may begin very early. Any attempt to isolate the media would likely make things worse. Rumors increasingly fill the void left by the lack of information flowing from the decision-makers. Such rumor generation may result in creating excessive panic, fear or civil unrest. Citizens will seek to understand what is occurring and what they need to do. Good information has a chance of helping, while lack of good information is likely be a hindrance at best. The media is either going to be an ally in getting accurate information out or a foe by creating their own version of the events.

Obstacles. Common misconceptions, misunderstandings, and the lack of information or knowledge can hinder the news media's effectiveness in assisting emergency managers in handling the crisis. The following are challenges to an effective public information campaign.

1. **Mutual Distrust.** Perhaps the oldest is mutual distrust between response officials and the media. Typically the media believes that government officials hide the truth, and the media must continuously search for the truth. Conversely, government officials may view the media as overly intrusive, sensationalizing the story or taking information out of context.

2. **Availability of Information.** Here two divergent approaches collide. Response officials want to be methodical in their analysis of the facts to ensure that they do not inaccurately identify the agent, provide incorrect response procedures, or mislabel the incident as a bioterrorist event. Inaccuracies could lead to public panic and jeopardize the public safety that they are trying to preserve and protect. Consequently, response officials typically release information only after careful deliberation. The news media is under tremendous pressure to continually provide information to the public. The deliberative approach used by response officials is not conducive to the media's fast-paced requirements. As a result, an "information vacuum" may occur and the media seeks other sources of information to fill the void. This makes frequent updates important (even if nothing has changed).

3. **Lack of knowledge of health and medical issues.** Some members of the media staff are specially trained to address various subject matter areas such as medicine and healthcare. This pool of individuals may be insufficient to cover the unfolding event. As a result, correspondents from other fields (e.g., legal, business, or national news) may be asked to cover the story. Their lack of familiarity with scientific or technical issues and jargon may result in unintentionally reporting incorrect or incomplete information.

4. **For Profit Impact.** The small family owned newspaper and radio station is a relic of the past. Today large corporations have acquired most of the media operations and now press for a level of profit that is sometimes viewed as challenging honest reporting standards. Though most journalists, photojournalists and their support staff of engineers, producers, and editors are professional, conscientious, and accept their social and ethical responsibility to gather and report news fairly, accurately and honestly, the influence of the new "Corporate Masters" can not be overlooked.

Potential Solutions. There are three suggested approaches to overcoming the previously described obstacles. Each of these must be proactively initiated to be effective.

1. **Training.** Both media and responder community personnel need to receive training that is targeted to improve their interactions with one another. At a minimum the lead emergency response officials should receive training to help them to develop their skills in the following areas: community relations, media relations, writing, public speaking, and audio/visual presentation. These skills should be considered critical to the emergency management public information officer (PIO). This training would help minimize the potential for a spokesperson to be misunderstood or make ambiguous statements. Effective communications coupled with risk communications training, is especially important in a bioterrorist incident where the need for clear and unambiguous information is parmount. The media should receive emergency response training designed to familiarize them in basic emergency response procedures that occur as a result of a bioterrorist incident. Improving the media's awareness to timelines and normal response activities and the time required to conduct response activities can greatly aid in the development and accuracy of public information announcements

2. **Establishing Credible Experts and Accurate Information Sources.** Credible Experts. The working group proposed that lead response officials identify credible experts to address media questions concerning a bioterrorist incident. As part of the emergency planning process, various bioterrorist agent or specific disease experts should be identified as part of the community or jurisdiction's emergency response team. When a bioterrorist incident occurs these individuals would be the recognized expert and the single point of information for the media. It is important to establish the presence and accessibility of credible experts before the information vacuum finds other potentially less credible or conflicting information sources.

Accurate Information Sources. Public attitudes and perceptions will be significantly affected by how a biological terrorism event is managed, and the quality and accuracy of the information that is provided. Accordingly, the relationship between emergency response management and the media is critical. The effect of uncontrolled and potentially distorted information could have disastrous effects on a stricken area. It is therefore critical to develop a dialog with responsible media personnel to examine ways in which credible options for information management and exchange can be secured. Incorporation of media planners into the emergency planning process could address these concerns up front and help to mitigate potential problems during an incident.

Local, regional, national, and international media organizations may compete for the story. Technology has brought global events into our lives on a daily basis. News stories that are occurring throughout the world compete for the public's attention and serve to dilute the focus away from other potentially more critical stories of local significance. This is true for emergency and disaster related stories that may initially go unnoticed due to other distractions. Pressures from competition could induce inaccurate media or emergency response reports. Public health and safety information officials, in partnership with media representatives, must maintain a "one voice of truth" that the public can trust. Misinformation will lead to public confusion, distrust and potential non-compliance with incident-specific instructions and guidance.

3. **Development of Bonds of Trust.** Developing trust among the public, government/response officials, and the media is essential during times of public disaster and emergency. Bonds of trust are developed through routine personal interactions over time and tied to historical performance (i.e., to what degree were you previously trustworthy?). Local officials and the media should take advantage of opportunities to interact with one another on a regular basis. This may be done in part by arranging understandings and agreements concerning emergency response operations in advance. Accuracy in reporting is vital for the public to trust the media. Reassuring the public and managing the crisis will be enhanced by a well-coordinated media plan. Despite establishing positive media relations, public health and emergency response officials anticipate that a bio terrorist incident may still cause wide spread panic and fear.

Final Considerations

- Good information is the foundation of a good policy. Addressing potential or real problems at the intersection of health and security must include efforts toward bolstering both the quality of and the transmission mechanisms for health-related information that may have security implications. Both sides of this issue have vested responsibilities, mutually to the public and their parent organization.

- Reporters will report more accurately if officials proactively offer information and assistance. Emergency managers that establish credible information

sources that are readily accessible, are likely to find that the media will use these avenues for information gathering purposes rather than resorting to unsubstantiated "experts."

• If there is a small release, public anger, not panic, will be directed toward the terrorist organization(s) but may also be directed towards any inadequacies perceived in law enforcement, fire protection, and public health response.

• Public health is a trust between the public and the government. The media, via public information, can be a bridge, keeping that trust intact. Ignoring or making assumptions about the media can be detrimental to that bridge.

• Public Information/Media are people with similar concerns and worries about an incident.

• Ameliorating panic can be achieved by showing that officials are in charge, have a game plan, are in control, know what they are doing, and are providing regular streams of up-to-date, valid and truthful information.

Special Considerations for the MEMS Concept when the Bioterrorism Agent is Communicable

The MEMS concept presented in earlier chapters of this pamphlet addresses the medical response needs that may result from a covert BW attack in which a non-communicable agent is released. This chapter discusses additional considerations that a community should plan for when the agent that is released is communicable. Exercises designed to test response to the release of communicable biologic agents demonstrate that when a communicable agent is involved, quarantine is an early consideration and therefore, this chapter begins with a discussion of quarantine. For example, the report of the TOPOFF exercise of 2000 revealed that a large-scale geographic quarantine was imposed in response to an intentional release of aerosolized Yersinia pestis, the bacteria that causes plague.

Much of the content of this chapter results from the efforts of a two-day working group that was convened to examine each component of the MEMS to determine how a bioterrorist attack with a communicable agent affects:

- The need for the component?
- The operational plans for the component?
- The staffing levels and mixes?
- Equipment and equipment levels?

Quarantine: Is it an advisable response to the release of a communicable biological agent?

A working definition of quarantine applicable to the current environment is provided prior to the discussion. Quarantine can be defined as the "compulsory physical separation, including restriction of movement, of populations or groups of healthy people who have been potentially exposed to a contagious disease, or efforts to segregate these persons within specified geographical areas."

Before implementing quarantine a community should examine the consequences of quarantine against any potential benefit. Benefits of quarantine in modern society may be limited. There are a limited number

of biological agents that are communicable person-to-person and that would result in a level of morbidity and mortality that justifies quarantine of large segments of population. Quarantine is often a consideration when smallpox is discussed, however, the relatively long incubation period of 10-17 days coupled with our society's travel habits means that dispersion of the agent would likely have occurred prior to any indication to consider quarantine. A decision to use quarantine as a tool to contain spread of an infectious disease will have health, law enforcement, and economic consequences. Health consequences include the potential to increase the infection rate within the quarantined population and the possible difficulty in delivering care to the quarantined ill. Law enforcement consequences include the requirement to dedicate personnel to enforcement of quarantine and the difficulty in using force, should it be necessary, to maintain quarantine. Economic consequences include disruption of commerce and transportation.

If a quarantine decision is made, there is an ethical requirement to provide health care, food and other services to the quarantined population. In a disaster situation, the resources may not be available to provide this level of support.

An alternative approach is to employ isolation. Persons with clinical or laboratory evidence demonstrating infections with an infectious disease should be isolated in accordance with the mode of transmission of the specific organism. Isolation is defined as the separation and confinement of individuals known or suspected (via signs, symptoms, or laboratory criteria) to be infected with a contagious disease to prevent them from transmitting disease to others.

Neighborhood Emergency Help Center (NEHC)

The NEHC will happen, either by accident of design, so communities should plan for it. In the event of a communicable agent attack, avoidance of large gatherings of people is preferred. However, the reality is that people will likely go out to seek information, prophylaxis and/or treatment so an NEHC will remain an important component of the MEMS. The original reason for establishing an NEHC was to offset the emergency departments in a community of all but the most acute/critical care. A communicable agent will not change this requirement.

There may be a need to set up NEHCs even earlier in the process. Initially, a community can consider staffing the NEHC with only epidemiological people who can disseminate information and appropriate advice. In this case, the NEHC can open with only a few tables and chairs and can grow as the incident ramps up.

The NEHC may become the point where vaccinations are available. In the case of smallpox, the actual application of the vaccination will take additional time. The multiple-puncture technique uses a pre-sterilized bifurcated needle that is inserted vertically into the vaccine vial causing a droplet of vaccine to adhere between the prongs of the needle. The droplet contains the recommended dosage of vaccine, and its presence within the prongs of the bifurcated needle should be confirmed visually. Holding the bifurcated needle perpendicular to the skin, 15 punctures are rapidly made with strokes vigorous enough to allow a trace of blood to appear after 15-20 seconds. Any remaining vaccine should be wiped off with dry sterile gauze and the gauze disposed of in

a biohazard waste container. This technique is far more time consuming that a simple intramuscular or subcutaneous injection, therefore, in order to maintain the desired throughput, additional staffing may be required.

A communicable agent will necessitate that all patients arriving at the NEHC be masked immediately upon arrival and that they remain masked throughout the encounter. Surgical masks will offer a great deal of protection however, if available, N-95 masks are preferred for the increased level of protection that they confer. Staff members must remain masked at all times within the NEHC.

Some communicable agents will require precautions beyond masking. For example, personnel involved with direct care of smallpox patient s should observe strict contact and airborne precautions (i.e., gowns, gloves, eye shields, and correctly fitted N-95 masks) until postvaccination immunity has been demonstrated (i.e., 6-8 days after vaccination of personnel). Shoe covers should be used in addition to standard contact isolation protective clothing to prevent transportation of the virus outside the isolation area. After postvaccination immunity has occurred, contact precautions with shoe covers should still be observed to prevent the spread of infectious agents. Communities may want to consider setting up NEHCs during flu season to "test" the concept.

Acute Care Centers (ACCs)

ACCs will remain critical components to the MEMS concept in the event of attack with a communicable agent. Hospital emergency departments and inpatient units will become saturated very quickly and those patients who require a less intensive treatment environment though still requiring inpatient care will need an available source of care. The ACC is the answer to this requirement in the context of MEMS.

There are several process changes that will be necessary in the ACC. This includes, first and foremost, strict adherence to masking of both patients and staff as recommended for the NEHC

The transmission mode of smallpox will require additional linen management procedures. Soiled linen becomes a potential source of spread of the disease. Therefore, it must be handled carefully and should be either autoclaved prior to transfer to a laundry facility or discarded. The ACCs will be set up in facilities that most likely will have no access to adequate autoclave equipment. For this reason, a community should consider disposable linens. Additional custodial/housekeeping staff may be required to handle the additional cleaning and any increase in the amount of contaminated waste that is generated.

Communities should consider additional space between beds in the ACS when the agent is communicable. An increase in the space between beds will either decrease capacity or increase floor space requirements.

Casualty Transportation System (CTS)

A communicable agent will not change the basic needs for healthcare in the community and a system to transport patients to and among homes, hospitals, NEHCs and ACCs therefore the Casualty Transportation System will remain a critical requirement. As in the NEHC and ACC both staff and patients must be masked at all times. Some

agents will require additional precautions, such as in the case of a smallpox release. Should this occur, casualty transportation personnel will also require additional contact isolation equipment as described in the ACC section.

Community Outreach/Mass Prophylaxis

Community outreach (CO) becomes even more important when a biological agent release is a communicable agent. The CO effort should start earlier than when the agent is non-communicable and will last longer (at least until everyone is vaccinated).

CO can expand beyond providing information, obtaining information, distributing meds/vaccines, etc. For example, in the event of a communicable agent attack, it is preferable that people remain in their homes and avoid large gatherings of people where person-to-person transmission of illness may occur. Assuming that the community does remain in their homes, avoiding public gatherings, one visit by CO may not be enough. Repeat visits should occur to make sure that people are alive and do not require additional services.

However, people will need to restock food and supplies and will therefore need to leave their homes. CO could add a "meals on wheels"/grocery delivery service so that people can follow guidelines to remain at home.

Coordinate the CO/MP effort with the local media. Communication is of vital importance. Strategies for communication for the duration of the incident must consider multiple communication channels and identification of credible people to convey the information. Effective communication will include information about the infectious disease; provide guidelines for public behavior to limit the spread of disease; and specific directions for access to prophylaxis and treatment. Well-planned, credible and timely information releases will help to dispel rumors and panic and enhance community cooperation.

Communities must keep in mind that it may be more difficult to recruit CO volunteers in the event of a communicable agent attack.

CO personnel will require vaccinations, PPE and isolation and education. If a vaccine is available to protect against the specific agent that has been released, the goal will be to vaccinate all potentially exposed population, however, the vaccine program must be prioritized. The MEMS concept advises that the first people to receive prophylaxis should be the first responders and the community's key medical and support personnel. An additional consideration is to provide any available prophylaxis to their families as well because should family members become ill, key personnel may not be available to report to duty.

It may be advisable to isolate newly vaccinated CO personnel from the general population following immunization for 6-10 days during the period of time it takes the vaccine (smallpox) to "take". During this time they could still come in contact with the disease and become infected.

Communities should adopt innovative processes to facilitate rapid dissemination of information, prophylaxis and treatment. For example, the University of Louisville has developed and tested a "Drive-Thru" Influenza Immunization Program. In this

program, 3,000 people were immunized in six hours by administering flu vaccine to people in their automobiles as they "drove-thru".

Prioritization

In the case of a smallpox release, the CDC recommends the following prioritization in "Vaccinia (Smallpox) Vaccine Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2001:

1st: Persons who were exposed to the initial release of the virus

2nd: Persons who had face-to-face, household, or close-proximity contact (<6.5 feet or 2 meters) with a confirmed or suspected smallpox patient at any time from the onset of the patients; fever until all scabs have separated

3rd: Personnel involved in the direct medical or public health evaluation, care, or transportation of confirmed or suspected smallpox patients

4th: Laboratory personnel involved in the collection or processing of clinical specimens from confirmed or suspected smallpox patients

5th: Other persons who have an increased likelihood of contact with infectious materials from a smallpox patient (e.g., personnel responsible for medical waste disposal, linen disposal or disinfection, and room disinfection in a facility where smallpox patients are present.

Public information is key to a successful MP/CO effort. Community outreach can provide essential communication to the population. (See MP/CO pamphlet for more detail).

Fatality Management

Personnel who will be handling bodies will need appropriate personal protection equipment, prophylaxis, and education.

The National Institute for Occupational Safety and Health addresses the potential hazards associated with rescuing victims, recovering deceased, and handling human remains, in "Suggested Guidance for Supervisors at Disaster Rescue Sites". The guidance is as follows: "Universal precautions should be strictly observed regardless of time since death. This includes use of appropriate barrier protection when handling potentially infectious materials." The specific biological agent released in the event will define "appropriate barrier protection".

It may be advisable, in some situations to cremate bodies rather than burying. Communities must weigh the potential benefits vs. the costs. If cremation is necessary, the cultural and religious attitudes of some groups must be addressed.

Conclusion

A BW incident is very different from any other type of disaster a community could face. Devastating numbers of victims may arrive at hospitals seeking care. The care of the presenting victims and asymptomatic, potentially exposed people along with medical prophylaxis, treatment, and information form the backbone of an effective response to a biological terrorism attack. The BWIRP developed a flexible mass casualty care system, known as the MEMS, to cope with the high numbers of casualties and those who think they are casualties.

This pamphlet strives to introduce the MEMS concept to the emergency medical planning community, as one possible option in preparing for a mass casualty incident. Since each community's available resources and medical requirements are unique, the information contained in this pamphlet should be viewed and used as a starting point to develop a pertinent preparedness and response strategies. This pamphlet is the result of a three-year effort of careful and detailed analysis of the MEMS concept. All modules were analyzed as if used in response to an act of domestic biological terrorism. An integrated, multi-agency, local, state, and federal team of experts who were committed to improving domestic preparedness and response conducted the approach and analysis of these modules.

Established on a modular basis and in concert with area hospitals, NEHCs and ACCs will provide emergency managers an improved mechanism for saving lives and mitigating the effects of a large-scale biological terrorism attack. In addition, emergency planners should integrate the CTS into the community's mass evacuation and emergency transportation plans to support the patient care modules. The MEMS does not create a new command or authority under which the hospitals must act. It integrates into and uses the established chains of command.

One of the most important aspects of the MEMS is that the modules are flexible and can be expanded or reduced in size and or function as needed. In a BW incident it will be difficult to actually predict the number of patients that will be affected. Therefore, it will not be known which, how many, and to what extent the modules will be needed. As the type and number of patients change so too can the MEMS modules be modified to accommodate those changes.

Another important aspect of preparing for biological terrorism is that the planning effort alone will enhance a community's overall preparedness for any catastrophic medical emergency by identifying existing response mechanisms, possible problems and solutions, developing plans and contingencies and, forging necessary mutual aid agreements, etc. Community emergency preparedness can apply to more than biological terrorism. These patient care and management plans may also be used for naturally occurring disease epidemics and other natural disasters that produce a high number of casualties.

Identified resources as described in this pamphlet were determined to be the minimal requirements for the basic operation of each described module. Locating resource pools continues to be an important issue that requires detailed preplanning by individual jurisdictions to reduce the chance of shortfalls. This point is true no matter what response concept is used or developed. A concurrent effort that may be performed during assessment of existing emergency

plans is the identification of all potential types, locations, and amounts of resources that may be available within the community or nearby jurisdictions. The aforementioned federal partners can also provide suggestions and insight to addressing the resource issue and in exercise design and execution.

Points Of Contact For Planning Assistance

To obtain additional copies of this pamphlet, or Volumes I and II of the 1998 Summary Report on BW Response Template and Response Improvements, or the Concept of Operations for the NEHC, ACC, please contact Mr. James Church, SBCCOM, BWIRP, at 410-436-5686.

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

- Online source for the 1998 Summary Report on BW Response Template and Response Improvements.
- Information and Fact Sheets on training exercises and equipment.
- Links to related sites including federal partners of the Domestic Preparedness Program, the Chemical Weapons Improved Response Program, and the Rapid Response Information System.

Department of Health and Human Services
Office of Emergency Preparedness
http://www.oep.ndms.gov
(301) 443-1167

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

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

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

U.S. Army Medical Research Institute of Infectious Diseases
http:// www.usamriid.army.mil
Attn: SGRD-UIZ-R
1425 Porter Street, Fort Detrick, Frederick, MD 21702-5001
(888) 872-7443

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

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

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

Department of Justice
http:// www.doj.gov

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

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

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Acronym List

List of Acronyms

ACC	Acute Care Center
ACLS	Advanced Cardiac Life Support
ALS	Advanced Life Support
APIC Inc.	Association in Infection Control and Epidemiology
ATLS	Advanced Trauma Life Support
BT	Biological Terrorism
BW	Biological Weapons
BWIRP	Biological Weapons Improved Response Program
CDC	Centers for Disease Control and Prevention
CMOP	Consolidated Mail Outpatient Pharmacies
CO	Community Outreach
COBRA	Consolidated Omnibus Budget Reconciliation Act
CTS	Community Transportation System
DHHS	Department of Health and Human Services
DMAT	Disaster Medical Assistance Team
DoD	Department of Defense
DOE	Department of Energy
ED	Emergency Department
e.g.	"For Example …"
EMS	Emergency Medical Service
EMTALA	Emergency Medical Treatment Active Labor Act
EOC	Emergency Operations Center
EOP	Emergency Operation Plan
EPA	Environmental Protection Agency
EVOC	Emergency Vehicle Operator Certified
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
HEICS	Hospital Emergency Incident Command System
IC	Incident Commander
ICS	Incident Command System

i.e.	"That Is …"
IMS	Incident Management System
LPN	Licensed Practical Nurse
MCC	Medical Command and Control
MD	Doctor of Medicine (Medical Doctor or Physician)
MEMS	Modular Emergency Medical System
MMRS	Metropolitan Medical Response System
MOU	Memorandum of Understanding
NALS	Neonatal Advanced Life Support
NDMS	National Disaster Medical System
NEHC	Neighborhood Emergency Help Center
NMRT	National Medical Response Team
NP	Nurse Practitioner
NPS	National Pharmaceutical Stockpile
OEM	Office of Emergency Management
OEP	Office of Emergency Preparedness
PA	Physician's Assistant
PALS	Pediatric Advanced Life Support
PIO	Public Information Officer
RN	Register Nurse
RT	Respiratory Therapist
SBCCOM	U.S. Army Soldier and Biological Chemical Command
UMB	Unified Medical Branch
USDA	United States Department of Agriculture
VA	Veterans Affairs
WMD	Weapons of Mass Destruction
Y/N	Yes/No