NEIGHBORHOOD EMERGENCY HELP CENTER

A Mass Casualty Care Strategy For Biological Terrorism Incidents

Prepared in response to the Nunn-Lugar-Domenici Domestic Preparedness Program by the Department of Defense, May 1, 2001

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INTRODUCTION AND BACKGROUND

Introduction

In recent years, growing concern over the likelihood of a terrorist attack involving the use of unconventional weapons, such as biological warfare agents, has increased. The threat is indeed serious, and the potential for devastating numbers of casualties is high. Our health and medical community must be prepared to respond to such an event. To facilitate response planning, the Biological Weapons Improved Response Program (BW IRP) developed a mass casualty care concept called the Neighborhood Emergency Help Center (NEHC). This concept describes the first operational component of a comprehensive health and medical response strategy being developed by the BW IRP. The purpose of this pamphlet is to provide basic information, highlighting key characteristics of the NEHC concept. This pamphlet is not extensive in detail; rather it is a summary of the information contained in the BW IRP technical report entitled NEHC Concept of Operations.[1] It should be noted that the Modular Emergency Medical System (MEMS), including all its components such as the NEHC, was developed with input from numerous and various sources. This pamphlet presents a system that should not be construed as the only method to address such an event. This pamphlet presents a detailed concept that may be used as a starting point or tailored as needed for specific application.

Background

In 1998, under the auspices of the Department of Defense (DoD) and the Domestic Preparedness Program (DPP), the BW IRP conducted a series of workshops aimed at identifying improved approaches to managing the consequences of a major biological terrorism attack. One product of this effort was a multiechelon interagency template for conducting a fully integrated biological incident response. The template depicts key response activities by which communities can delegate responsibility and allocate resources. MEMS represents the portion of the template that outlines measures to rapidly enhance a community's medical capacity to effectively manage incident victims. A fundamental part of the MEMS strategy involves establishing a network of high-volume, temporary care facilities called NEHCs.

In 1999, the BW IRP initiated an effort to gain a better understanding of the operational feasibility and logistical requirements associated with executing MEMS. The first step in this process involved an extensive technical study of the NEHC concept. The BW IRP invited a panel of health and medical experts to help draft a conceptual description of the NEHC. Then, with the use of computer simulation modeling, the NEHC concept was applied to three hypothetical incident scenarios. Simulation scenarios involved attacks using Anthrax, Tularemia, and Venezuelan Equine Encephalitis agents. After running a series of simulated attack trials, the BW IRP invited a second panel of health and medical experts to review the NEHC's performance and provide constructive feedback regarding its design. Finally, the BW IRP sponsored a full-scale operational test of the NEHC concept. Lessons learned throughout each phase of the study were used to modify and enhance the original NEHC design.

The NEHC concept provides emergency managers, public health professionals, and

medical providers with a flexible approach for saving lives and a way to mitigate the effects of a major biological incident. The *NEHC Concept of Operations* provides a complete description of the final NEHC concept. Though the information contained in the report is not by any means a final solution, we believe it can be tailored for individual community application.

Modular Emergency Medical System (MEMS)

To ensure proper perspective of the concepts and processes that comprise the NEHC, readers must first have a basic understanding of the broader MEMS (see Figure 1). Many experts believe that a biological incident has the potential to significantly overwhelm the health and medical capabilities of most U.S. cities. Recognizing this threat, the BW IRP sponsored an effort to outline a new strategy that would allow cities to provide an effective response to such an incident. The BW IRP assembled a working group that included experts from public health, medical, and emergency management fields. After intense discussion, the working group drafted a generic strategy called the Modular Emergency Medical System. The strategy outlines response measures that can be tailored to the particular needs of individual communities and to a variety of possible scenarios.

One major obstacle to an effective biological incident response is that most communities have limited ability to expand their health and medical capacity using the existing infrastructure. Modern trends to become leaner and more efficient have forced hospitals, and other aspects of the health and medical system, to do away with abundant surge capacity. The MEMS helps communities compensate by providing a framework that outside disaster medical resources can quickly and effectively integrate with, and that augments local health and medical efforts. The initial response framework of the MEMS is established through rapid mobilization of available medical assets into two types of expandable patient care modules: Acute Care Centers (ACCs) and NEHCs. ACCs function as mass inpatient care facilities designed to augment hospital capacity to admit incident victims. NEHCs function as high-volume casualty reception centers, performing victim triage and dispensing prophylactic medications and self-help information. A network of these preplanned medical facilities enhances a community's capability to care for large numbers of incident casualties by converting nonhospital facilities into standardized mass care centers. By augmenting the local health and medical infrastructure, critical portions of the existing systems, such as hospitals and 9-1-1 Emergency Medical Services, will continue to function effectively. This is particularly important because it ensures that the local medical system will continue to meet the needs of the incident victims as well as the needs of non-incident related patients.

The modular design of the MEMS has built-in flexibility that allows integration of multiple components. A network of standardized modular care centers can be easily expanded or contracted as resources are made available and as the incident requires. The ACC and NEHC, integrated with an aggressive community outreach effort and a dedicated casualty transportation system, work together to provide a wide range of care and services to the victims of a biological terrorism incident.

Current medical systems of most metropolitan communities in the United States include public and private area hospitals, outpatient clinics, ancillary care organizations, and private physicians. Together these organizations have an enormous amount of resources that would be needed in a biological incident. Unfortunately, because

these assets are loosely organized at best, with no unified authority, their efforts will be disjoined and inefficient. By establishing a structured unified medical command, communities will have a more effective means to harness and optimize available resources. The MEMS strategy allows communities to do this during emergency operations through the activation of preplanned communication links. The organization and management of the MEMS is based on the Incident Command System/ Incident Management System (ICS/IMS), which is already utilized nationally by the emergency services community to define roles and structure command and control relationships. Under the MEMS, local hospitals are linked to NEHCs and ACCs and coordinate and direct patient care, medical logistics, and information flow.

To execute the MEMS strategy, participating hospitals, clinics, and private medical doctors would temporarily forego their autonomy and jurisdictional medical statutes, and function as a unified system. Such drastic measures will be necessary to successfully minimize the morbidity and mortality of a catastrophic event. In emergency situations, individual area hospitals and their associated centers could be linked to the community's ICS to form the basis of a unified medical command structure.

For example, as an incident escalates, each local hospital implements its internal disaster plans and establishes an emergency Medical Command Center (MCC). As hospitals reach capacity and are no longer able to divert patients to other hospitals, they would request that the city activate the MEMS to provide necessary relief. The city activates emergency mobilization and acquisition plans to establish NEHCs and ACCs at predetermined locations. As the temporary care centers are established, they would be linked to a supporting hospital. ACCs will allow hospitals to transfer and redirect admitted patients that require non-critical and supportive care. At the same time, outpatient clinics may be expanded into NEHCs, helping direct non-critical and psychosomatic

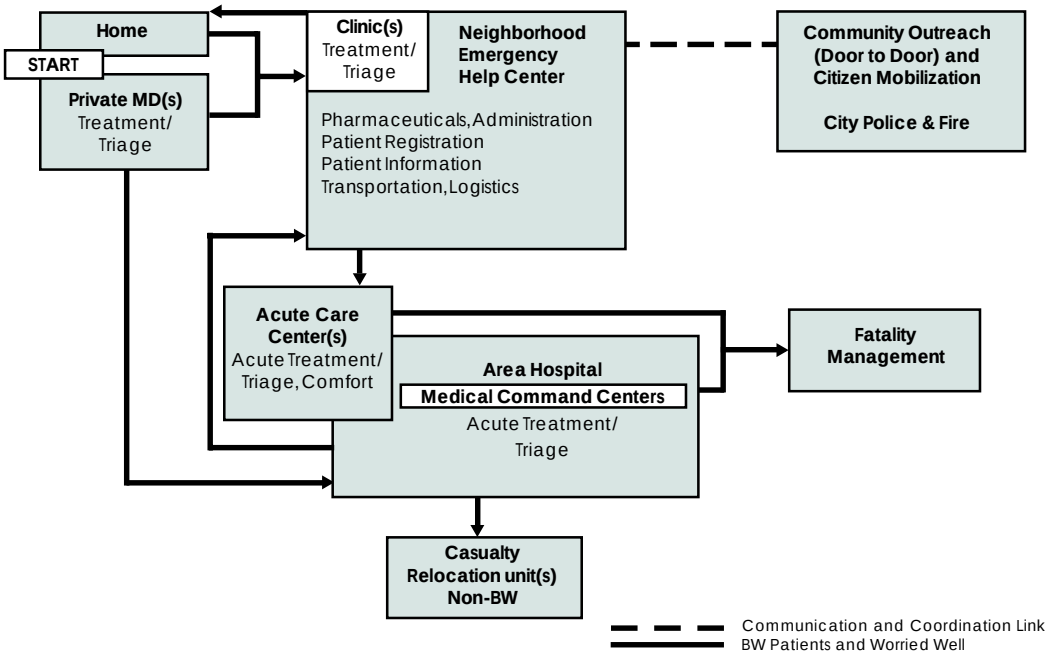

Figure 1 - Modular Emergency Medical System

casualties away from hospital emergency departments. The MCC would allow hospitals to coordinate and direct health and medical operations throughout a predetermined geographic sector, while a unified medical command directs operations at the city level. Some communities might prefer an alternative approach to this organization by establishing the ACCs and NEHCs as stand-alone facilities not associated with area hospitals. This approach would make command, control, and logistical support of the centers a direct responsibility of the community's city-level authorities (e.g., public health department or emergency management office). It should be noted that if the incident requires establishment of more than five to seven temporary care centers, the span-of-control may become too great for a single entity to manage.

In addition to ACCs and NEHCs, the MEMS makes use of a community outreach effort, which could be organized by local law enforcement, fire, or volunteer organizations to facilitate the medical response and public information efforts. If needed, the outreach could conduct a door-to-door sector survey of severely affected communities, identifying victims that are otherwise unable to access necessary care. In an incident that is thought to involve a highly contagious disease, it may be best to isolate individuals from one another and avoid mass gatherings. In such an incident, authorities could instruct citizens to stay home and receive assistance via community outreach.

Key Aspects Of MEMS

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

The MEMS also calls for establishment of a dedicated casualty transportation system to facilitate the movement of patients between various care centers (e.g., NEHCs, hospitals, and ACCs). The casualty transportation component is critical to the success of the MEMS as it will expand the community's patient movement capacity, regulate patient flow throughout the medical system, optimize system-wide resource utilization, and ensure timely care. Such a system might also become necessary if authorities choose to transfer non-incident related patients from local hospitals to distant locations in order to provide additional space for incident victims. Under such a situation, the casualty transportation component of the MEMS could function as the local link to the National Disaster Medical System (NDMS) orchestrated by the U.S. Department of Health and Human Services.

It is highly unlikely that the amount of resources and the number of victim care centers needed will be known at the on-set of the incident. It will also be difficult to predict the particular needs of victims. Therefore, biological incident response plans must be extremely flexible to accommodate the range of possibilities. The MEMS is a flexible strategy that allows communities to effectively meet the time-critical needs of biological incident victims. The MEMS modular approach can be expanded and contracted as needed. By constructing an emergency network of participating medical organizations, pre-selecting locations for establishing temporary medical centers, and developing personnel mobilization plans and resource acquisition plans, communities will be better prepared to respond quickly and efficiently.

Neighborhood Emergency Help Center (NEHC)

Development

In January 1999, the BW IRP sponsored the establishment of the Casualty Management Working Group. In doing so, the working group was charged with studying the issues associated with providing mass casualty care in response to a catastrophic biological incident and identifying a consensus-based strategy to improve the overall effectiveness of such a response. The BW IRP Casualty Management Working Group project coordinator solicited participation from several federal, state, and local agencies, private institutions, and subject matter experts. Candidates were identified based on their specific knowledge and expertise in various emergency management, public health, medical, and medical logistical backgrounds. Of the candidates, 12 individuals were invited to serve as the Casualty Management Working Group. The first task of the working group was to analyze and expand upon the concept of the NEHC component of the MEMS.

From February to July 1999, the Casualty Management Working Group conducted a series of facilitated workshops focused on improving and refining the NEHC concept. During the process, an operations research model was constructed to help participants conceptualize and analyze the concept's design. An initial draft of the *NEHC Concept of Operations* was prepared based on the working group's discussions. The working group participants reviewed the initial draft and in July 1999, an interim consensus was achieved pending the results of a validation effort that involved peer review and functional testing of the concept.

In August 1999, the BW IRP invited an independent panel of experts to review the draft *NEHC Concept of Operations* and validate the simulation model. The results of that review were presented to the Casualty Management Working Group and consensus revisions were made to enhance the NEHC design.

In November 1999, the BW IRP sponsored a functional test of the NEHC concept. The event consisted of a 2-day field test at Aberdeen Proving Ground, Maryland, and involved more than 300 participants. Testing was focused on generating empirical data regarding the operational feasibility of the NEHC design. The results of the functional testing were presented to the Casualty Management Working Group and, once more, revisions were made to enhance the NEHC design.

In January 2000, a second draft of the *NEHC Concept of Operations* was prepared based on the working group's analysis of the concept validation process. The working group participants reviewed the second draft and in March 2000, an interim consensus was achieved pending the results of testing the simulation model against alternative attack scenarios.

In July 2000, the BW IRP sponsored a series of tabletop exercises aimed at analyzing the operational feasibility of the NEHC concept in a series of scenarios that involved different biological agents (e.g., Bacillus anthracis, Francisella tularensis, Venezuelan equine encephalitis virus). Once again, the BW IRP invited an independent panel of experts to review the draft *NEHC Concept of Operations* and analyze the performance of the simulation model. The results of these exercises were presented to the Casualty

Management Working Group. This pamphlet summarizes the information contained in the third and final draft of the *NEHC Concept of Operations*.

Assumptions

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

1. A large-scale biological terrorism incident will produce thousands to hundreds of thousands of casualties and/or fatalities.
2. During a biological terrorism event, actual infected casualties and the "worried well" seeking aid will overwhelm the emergency medical system and hospitals.
3. Most casualties seeking medical care following a biological terrorism attack will be ambulatory.
4. Hospitals will activate internal disaster plans and redirect resources to care for the most seriously ill.
5. Establishing a system of large community-based outpatient centers is the most efficient way to provide rapid treatment and prophylaxis to a large population.
6. During a large-scale biological terrorism event, the standard of care will be lower to provide care to all those affected.

Purpose

The NEHC serves the following purposes:

1. Direct casualties and "worried well" away from emergency departments (EDs), allowing hospitals to continue to remain open in some capacity.
2. Render basic medical evaluation and triage, allowing medical providers to focus their efforts and make efficient use of limited resources.
3. Provide limited treatment to people seeking aid, including stabilization care and distribution of prophylactic medications and self-help information.

Policy

This document does not attempt to resolve legal issues but highlights concerns that were identified while developing the NEHC concept.

Depending on the scope and magnitude of the event, healthcare practices would likely have to change to best utilize the available assets and care for the greatest number of casualties. Decisions may be made to ration the use of the community's limited medical resources until significant mutual aid, state, or federal resources arrive. Liability issues related to negligence and malpractice will have to be addressed as hospitals and clinicians are asked to manage the high volume of casualties.

Legal Issues

- Restricting direct hospital access
- Credentialing out-of-state providers
- Providing immunity to negligence and malpractice as a result of a reduced level of care.

Workman's compensation insurance should be provided to all medical providers as disaster declarations are made. Legality issues such as restricting direct access to hospitals and redirecting casualties to alternate care facilities may also arise. Also, local and state planners should develop an emergency screening and credentialing process for accepting and integrating out-

of-state providers. The reality is, the standard of care will be lower than clinicians and patients are accustomed to providing and receiving, respectively. The personal attention that is usually expected and received will be significantly reduced. These circumstances will also require medical decisions at every level to be made swiftly based on limited information. New medical care standards tailored for managing catastrophic casualty events should be developed to assist medical professionals in these situations. The design of the NEHC considers such factors while attempting to provide the best care available for the most people under these conditions.

Prioritizing Care

Time demands and the overwhelming number of casualties produced by a biological terrorism incident may necessitate the rapid prioritizing of casualties seeking aid. The operational goal of each NEHC is to process 1,000 patients per 24-hour day, meaning the facility must sustain an average rate of 42 patients per hour. Most experts agree that a system for rapidly assessing and prioritizing patients is required to maintain such an aggressive patient throughput while ensuring adequate care. To achieve this operational goal and improve overall patient population outcome, the NEHC uses the process known as triage, an ongoing process throughout the casualty care chain, to assign patients a priority of care and disposition. Evidence that such a rapid rate can be sustained is found in the article *Provision of Emergency Medicine Care for Crowds*.[2] The 1,000 patient per day rate applies to one NEHC. Due to the modular approach for the MEMS, the proper number of NEHCs will depend on the situation and affected population.

To implement triage criteria, medical personnel must limit their time with one person in favor of treating many, keeping with the ultimate duty of the NEHC to do the greatest good for the greatest number of patients. In a major biological incident, medical personnel must be trained to understand that their natural instinct to deliver as much care as needed for each patient is not optimal and may be deleterious. During a biological terrorism incident, effective use of triage is critical to the overall success of the medical response because it allows responders to better manage care and resources.

Scope of Care

In addition to conducting brief clinical assessment and triage of victims, the NEHC provides limited treatment. Primarily, the NEHC functions as a high volume point of distribution for prophylactic medications, self-help information, and instruction. The goal of the center is to quickly sort through the thousands of people seeking care, identify those that require inpatient care to survive, and ensure they are stabilized for evacuation to a definitive care facility. Patients that do not require inpatient care are provided self-help information and appropriate prophylactic medication and sent home. The NEHC is also designed, optimized, and equipped to provide immediate, appropriate, and proven acute medical interventions that have the greatest potential to positively impact the survival of acutely ill biological weapon (BW) victims. These interventions may include intravenous antibiotics,

Functions Of The NEHC

Primarily, the NEHC functions as a high volume point of distribution for prophylactic medications and self-help information. The operational goal of the center is to process 1,000 patients per day.

bronchodilators, hemodynamic (blood pressure) support, and all of the necessary medications required for patient comfort (e.g., pain management, anti-nausea, and anti-anxiety). The NEHC also maintains a limited capability to care for non-BW patients (e.g., trauma, cardiac, asthma, and burns), as traditional emergency department admissions will continue and some of these patients may self-refer to the NEHC. Providing this level of acute care is consistent with the disaster medicine philosophy of providing the greatest good for the greatest number of people. By pushing this care outside of emergency departments, the majority of victims can be adequately cared for and sent home, reducing the load on hospitals.

Command Relationships

The NEHC is organized and administered to meet the needs of its patient population. Operation of the NEHC must be guided by written policies and procedures established by the local emergency planners prior to "standing up." Establishing operations management policies for an NEHC requires knowledge of tasks to be accomplished, analyzing personnel and material efforts necessary, and instituting a systematic approach toward task accomplishment. The organization of command and control for the NEHC is modeled after the nationally recognized ICS and the companion Hospital Emergency Incident Command System (HEICS). The emergency management organization pictured below reflects the minimum management staffing requirements for the operation of an NEHC (see Figure 2). This management structure can easily transition into a full-fledged HEICS as adequate resources are made available for the casualty management effort.

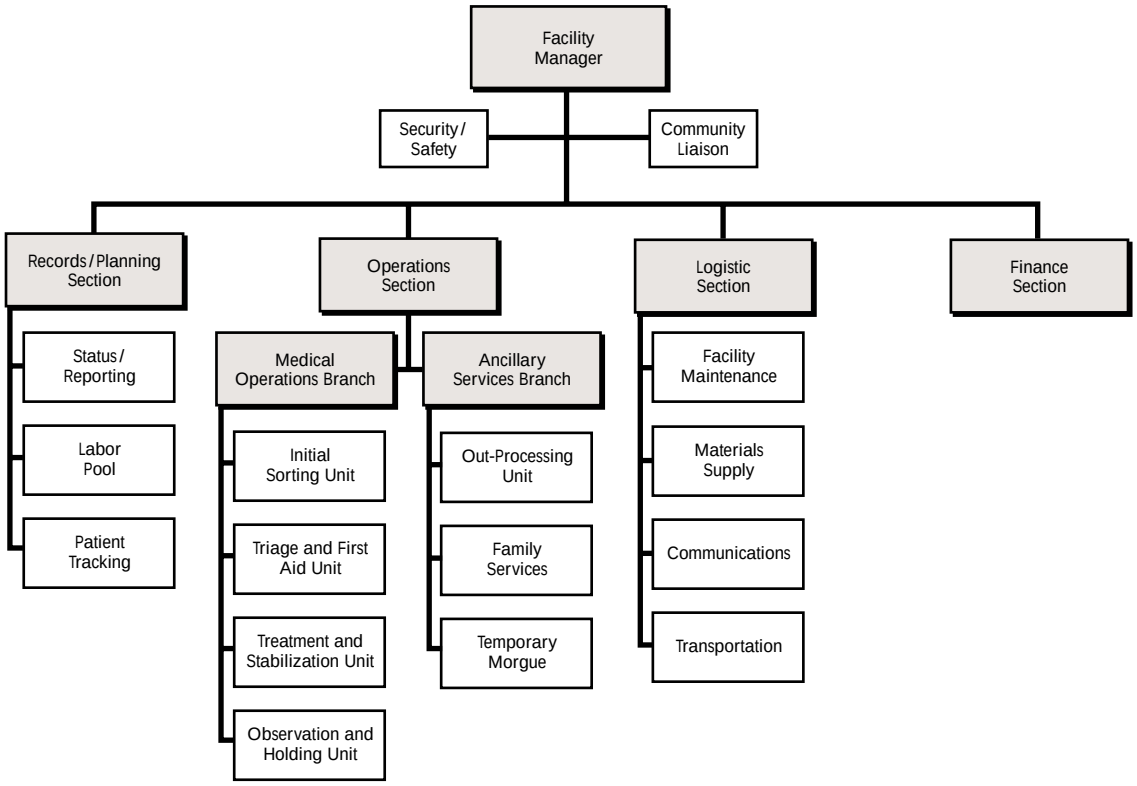

Figure 2. NEHC Command Organization

Staffing

An enormous amount of patients seeking treatment will cause hospitals to recall a large portion of a community's emergency medical personnel, creating a shortage in available skilled providers. This will leave few qualified emergency medical personnel to staff the NEHC. Consequently, physicians likely to staff the NEHC may include family practitioners, dentists, dermatologists, and other non-emergency specialists. These physicians may not have used their emergency medicine skills in many years. They may not be current in treatment regimes or have the ability to administer intravenous lines, "run" a cardiac arrest, or even recognize symptomatology of a life-threatening illness. Planners should consider provisions for expeditiously accepting out-of-state medical care providers.

STAFFING

A Staff of 80 physicians, nurses, pre-hospital care providers, clerical personnel and civilian volunteers are needed to operate a fully functional NEHC per 12-hour shift.

The nature of the medical needs and the shortage of staff in a biological terrorism incident make traditional role delineation impractical. Therefore, divisions of responsibilities for various aspects of patient care and program administration should be based on experience, special talents, and interests of individual staff members. [In this way, each staff member's particular abilities are fully utilized, and operations will run more efficiently.] Nonmedical personnel, such as clerks and volunteers, are utilized to a great extent in the NEHC to lessen the burden on the medical staff. A staff of 80 physicians, nurses, pre-hospital care providers, medical clerical personnel, and civilian volunteers are needed to operate a fully functional NEHC per shift (see Figure 3). The local Office of Emergency Management (OEM) should establish and provide a centralized registration and credentialing system to rapidly process all persons assigned to an NEHC. Furthermore, your NEHC staffing requirements should be stated in your Metropolitan Medical Response System plan, if one exists. This will allow the U.S. Department of Health and Human Services' Office of Emergency Preparedness to preplan the acquisition of the NEHC staff.

Administrators must ensure that appropriately educated and qualified professionals staff the NEHC during all hours of operation. NEHC staff members must be prepared to operate the NEHC on two rotating 12-hour shifts for the first 72 hours because available personnel will be limited. As additional assistance arrives, the center should transition to three 8-hour shifts to sustain continuous operations.

NEHC Functional Areas

The NEHC consists of nine operational components.

1. **Operations Center.** This unit is responsible for the command, control, and administrative activities of the NEHC. This unit conducts the administrative records processing, periodic reporting, external communication, and coordinates patient evacuation and logistic support. The unit also develops and enforces the internal policies and staffing strategies to operate the center, consistent with the guidance provided by its parent medical command element, the MCC.

2. **Initial Sorting Area.** This unit is responsible for identifying critically ill patients and filtering them to the Treatment and Stabilization Area. This unit is also responsible for issuing each patient a control number. The unit quickly assesses each patient as they enter the center, separating the critically ill and non-critical patients.

3. **Registration Area.** This unit is responsible for initiating the medical recording and victim tracking processes. The unit also provides a sheltered waiting area for patients prior to registration. The unit documents general patient information and establishes a patient record for all noncritical patients.

4. **Triage and First Aid Area.** This unit is responsible for continuing the triage processes and providing first aid care. The unit conducts a simple clinical evaluation of all noncritical patients following registration and records initial assessment findings, treatment, and vital signs. Patients identified as needing care beyond first aid treatment are transferred to the Treatment and Stabilization Area.

5. **Out-Processing Area.** This unit is responsible for providing an ample and expeditious clearing process. This unit provides mass patient education and counseling briefings and issues self-help information packets. The unit also distributes prophylactic or therapeutic medications and collects patient records upon discharge.

6. **Treatment and Stabilization Area.** This unit is responsible for conducting rapid patient assessment and providing initial stabilization treatment to critically ill patients. This unit provides reasonable lifesaving intervention to stabilize patients for rehabilitation or transfer to a definitive care facility.

	Facility Manager	Medical Operations Section Chief	Records/Planning Section Chief	Logistic Section Chief	Transportation Officer	Communication Officer	Maintenance Officer	Physician	Physician Assistant	Family Nurse Practitioner	Nurse	Paramedics	EMT	Clerk	Security Personnel	Housekeeping Personnel	Volunteer	Total
Operations Center	1	1	1	1	1	1								2	1			9
Initial Sorting Area														2	1		2	5
Registration Area														2			6	8
Triage and First Aid Area													5	1			6	12
Out-Processing Area										1	1			2	2		5	11
Treatment and Stabilization Area								3			3	3	1	1		1	5	17
Observation and Holding Area									1		3			2		1	5	12
Temporary Morgue														1			1	2
Service Support Area							1							1			2	4
Total Personnel →	1	1	1	1	1	1	1	3	1	1	7	3	6	14	4	2	32	80

Figure 3. NEHC Staffing Summary

7. **Observation and Holding Area.** This unit is responsible for continuing the initial stabilization care and monitoring the outcome of treatment until patients are cleared for discharge. This unit provides continuation of the care initiated in the Treatment and Stabilization Area and provides an area to hold patients who require hospitalization until they are transported to a definitive care setting.

8. **Temporary Morgue.** This unit is responsible for providing initial fatality processing and temporary storage of remains until they are transferred to the appropriate mortuary services. The unit records personal data of the facilities, tags the remains, inventories personal effects, and arranges for transfer.

9. **Service Support Area.** This area accommodates the NEHC's multiple support activities, such as facility maintenance, housekeeping, equipment/supply storage, staff break area, and in certain cases, family services and counseling areas.

Patient Flow

Patient flow is illustrated in Figure 4. Casualties arrive at the NEHC primarily by their own means and are directed to the Initial Sorting Area as they enter the center. Patients are rapidly assessed and sorted by triage personnel into two groups. The first group includes patients that obviously require immediate care. These patients are issued a control number and transported directly to the Treatment/Stabilization Area. All non-critical 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. Patients not requiring care beyond prophylaxis and self-help information are categorized "minimal" and directed to the Out-Processing Area. Patients sent to the Out-Processing Area are given an instructional briefing, may be issued prophylaxis depending on availability and determination of how the locality will treat worried well, and discharged. Discharge includes collection of patient records and, if needed, referral to psychological counseling or other human relief services. Patients identified as needing medical care beyond first aid, during Triage and First Aid, are re-categorized "immediate" or "delayed" and forwarded to the Treatment and Stabilization Area.

As severely ill patients arrive at the Treatment and Stabilization Area they are assessed head-to-toe and triaged prior to receiving care. The medical providers in this area will render initial stabilization and treatment in the order of assigned triage priority. Patients categorized "immediate" are treated first, then "delayed," followed by "expectant." Once they have been stabilized within the limitations of the NEHC capabilities, patients are transferred to the Observation/Holding Area. Deceased patients are pronounced dead by a Stabilization Team Physician and transferred to the center's Temporary Morgue. Patients

SPECIAL ACCOMMODATIONS

In order to minimize disruption to patient flow, the NEHC must incorporate accommodations for special-needs patients such as children, elderly, disabled, or patients without relatives. Parents and guardians presenting with special-needs patients should be processed together regardless of their triage categories.

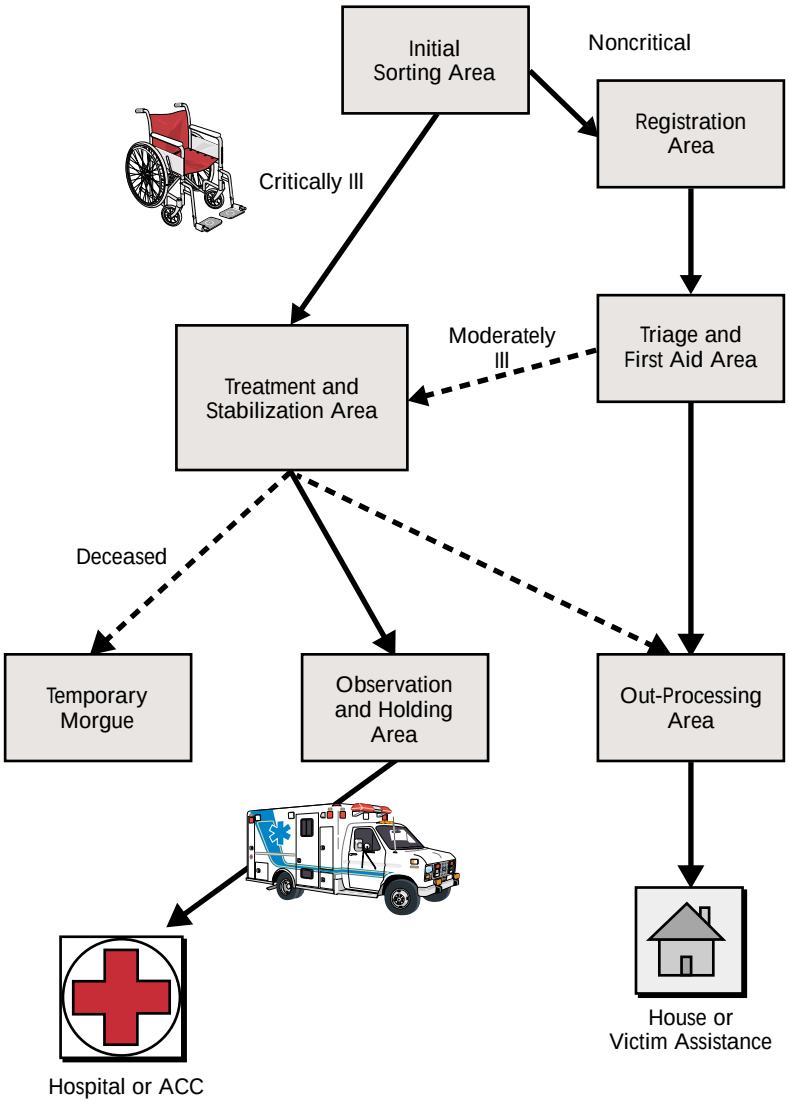

Figure 4. NEHC Patient Flow Diagram

categorized "expectant" are transferred to the Observation and Holding Area for monitoring until all patients assigned "immediate" and "delayed" priorities have received care. All other patients transferred to the Observation and Holding Area will continue treatment under medical supervision. Arrangements are made to evacuate patients requiring inpatient care to a definitive care facility. In some instances, patients evacuated from the NEHC may not be clinically stable because of the severity of their condition, limited medical resources, and time constraints. Patients, whose condition allows, may be released from the Observation and Holding Area for out-processing.

To minimize disruption to patient flow, the NEHC must incorporate accommodations for special-needs patients such as children, elderly, disabled, or patients without relatives. Parents or guardians presenting with special-needs patients should be processed together regardless of their individual triage categories.

The ultimate success of the NEHC will rest on the willingness of patients to utilize the facility. It will be important to actively direct casualties to the NEHC. This will largely be the a function of the public information effort. However, once patients arrive at the center, a deliberate effort must be made to

ensure people do not "renege" or give up on the process before they have received care. Efforts should be made to reduce individual waiting times, but even in ideal situations this may be unavoidable. Measures must be taken to reinforce the individual's certainty of being serviced by this system. Techniques such as projecting the time in which one can expect to be serviced, providing information that promotes the decision to stay, and assigning and processing patients in groups, will all help build individual confidence and reduce anxiety.

Information Flow

Individual patient information is captured on a patient record. This document is intended to accompany patients throughout the MEMS process. The records of patients discharging to home are collected as they out-process the center. Copies of these records should be maintained at the center and used to generate data critical to epidemiological investigation efforts. Records of patients transferring to a hospital or ACC should accompany those individuals to the next level of care. Information from these records is used to initiate the receiving facility's patient log as well as continue care. A patient tracking log should also be maintained for accountability purposes to record the arrival and departure of all patients presenting to the center.

INTEGRATION & INTEROPERABILITY

The NEHC is one component of a broader health and medical response system, the MEMS. The integration and interoperability of the NEHC with other areas of a community's public health response is critical for successful mass casualty care.

The NEHC generates situation/status reports reflecting patient and staffing activity as well as material and personnel accountability. Emergency planners must pre-establish specific reporting processes. Parent command elements to the NEHC must identify standardized reporting forms and formats to facilitate compiling and analyzing information from multiple centers. Data from these reports are used to make operational decisions on medical logistical support, mobilization, and demobilization operations. Utilization of the World Wide Web to assist this process may be a feasible option.

Responsibility Integration and Interoperability

The NEHC does not function as a stand-alone operation. The NEHC is one component of a broader biological terrorism response system, the MEMS. The integration and interoperability of the NEHC with other areas of the public health response is critical for successful mass casualty care. Given the potential magnitude and range of scenarios involved with biological terrorism, it is essential that medical integration and interoperability occur at every level of government: local, state, and federal. It is equally important to integrate the community's private sector medical providers, including private physicians, hospitals, and clinics. Integration with medical evacuation (e.g., Casualty Relocation Unit [CRU]), receiving inpatient care facilities (e.g., hospitals or ACCs), community outreach, and the medical logistical systems are particularly critical. The NEHC support service requirements include, but are not limited to, community outreach, physical security, social services, public affairs, billeting, feeding, waste management, logistics, and maintenance. The NEHC must coordinate with appropriate command elements to ensure smooth, timely, and seamless patient flow and to sustain operations. The NEHC

is not a definitive care facility; therefore, emergency medical planners must coordinate medical regulation of patients to receiving facilities.

Other Major Requirements

Emergency planners must conduct an assessment of their currently available NEHC related personnel, resources, and facilities. They must identify mechanisms to rapidly fill shortfalls before the NEHC strategy can be employed.

1. **Logistics.** During a major incident, the affected community can receive personnel and material assistance via air, ground, and sea. The local OEM will likely coordinate and direct the reception, inventory, and distribution of these resources at preplanned reception points.

2. **Equipment/Supplies.** It is recommended that at least 72 hours worth of medical equipment and supplies be predetermined and on hand when the NEHC(s) are established. Planners must evaluate their community's current equipment stockage, availability, and turnover. During emergency operations, appropriate stocks of necessary medical supplies and equipment must be on hand at all times to sustain continuous NEHC operations.

3. **Pharmaceuticals.** Necessary drugs and agents must be made immediately available to the NEHC. If the decision to provide mass prophylaxis is made, then such medication should be provided to sustain distribution operations. Pharmaceuticals must be inspected to ensure they are not expired, and refrigerated storage accommodations may be required for certain medications.

4. **Transportation Support**. As with other disaster response operations, the local OEM will likely remain ultimately responsible for ensuring that adequate medical transportation and logistical support is provided. This support is critical to the center's ability to reduce patient mortality and sustain maximum patient throughput. As part of the MEMS, the NEHC is intended to operate with pre-established emergency transfer agreements for patient evacuation to hospitals or ACCs. Continuous coordination between the NEHC and the patient evacuation resources, such as the CRU, must be maintained to ensure adequate patient flow and maximum utilization of the entire medical system. The NEHC is not capable of providing medical personnel or medical supplies and equipment through the patient evacuation process.

5. **Communication System.** The NEHC is a high volume user of telecommunications and information services. The better the internal and external communications systems available to the NEHC, the more effectively it will function. It is recommended that emergency planners arrange for one or more unlisted telephone numbers per NEHC. Ideally, each center should be equipped with two-way radios for internal communication between the facility areas as well as augmenting external communication with other components of the MEMS. A standardized electronic information system should be planned for and installed to support clinical management, patient tracking, and command and control.

6. **Site Selection.** The location of the NEHC is crucial to its mission. Proximity to an area with high traffic volume is advantageous because of the visibility. Factors such as services offered and patient volume will directly influence the site selection as well as the size of building and parking requirements. The NEHC placement strategy can be based

on police precincts, zip codes, school districts, fire/Emergency Medical Services (EMS) response areas, voting districts, or hospital locations. The NEHC should be located within a reasonable distance of the center of the designated population it is intended to service. The center should be easily recognizable and its entrance must be well marked. The facility must allow easy access for private, delivery, and emergency vehicles.

7. **Building.** The NEHC requires approximately 15,000 square feet. These space requirements were tested and validated in a full-scale functional test of the NEHC concept. The facility should be a pre-existing structure that has adequate electricity, sewage systems, running water, heat and, if possible, air conditioning. Recommended buildings for use as an NEHC include clinics, outpatient surgery centers, health clubs, community centers, National Guard armories, schools, hotels, university infirmaries, 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 CRU. A separate controlled entrance for staff use is also recommended for security and safety reasons. 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 wheeled stretchers or wheelchairs without difficulty. Ideally, the building selected for the NEHC should accommodate all patient areas on the ground floor to facilitate patient flow.

Possible Sites For NEHC

- Clinics
- Outpatient surgery centers
- Community Centers
- National Guard armories
- Schools
- Health Clubs
- Hotels
- University infirmaries
- Large shopping centers
- Malls
- Fire Houses

8. **Extemporaneous Training.** The success of the NEHC will largely depend on the effectiveness of the training program. At a minimum, staff members should receive extemporaneous training that addresses the biological agent(s), the mission of the NEHC, standard perating procedures, and individual responsibilities or tasks. All staff, including the volunteers, must receive this training prior to the opening of the center.

9. **Security.** The NEHC requires a minimum of three security personnel per 12-hour shift. Security personnel are necessary to control entrances and maintain physical security of high-risk areas (e.g., temporary morgue, dispensary, and the medical supply area). If needed, additional crowd control support can be coordinated through the local law enforcement agency. The NEHC will benefit greatly by making maximum use of directional signage to facilitate order and clarify instructions.

Conclusion

The care of presenting casualties and "worried well" along with mass prophylaxis form the backbone of an effective response to biological terrorism attack. The BW IRP developed a flexible and tailorable mass casualty care strategy that is capable of filling current gaps in our nation's civilian medical response to such an attack. One critical component to this system involves expanding the capabilities of existing outpatient clinics to provide rapid triage and distribution of medical prophylactic medications and self-help information. Established on a modular basis and in concert with hospitals and ACCs, NEHCs can provide emergency managers an improved mechanism for saving lives and mitigating the effects of a large-scale biological terrorism attack. The BW IRP will continue to study and enhance the MEMS strategy as it explores each component of the integrated response template.

Points Of Contact For Planning ASSISTANCE

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

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

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

DHHS/Office of Emergency Preparedness
http://www.oep.dhhs.gov
(301) 443-1167

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

Centers for Disease Control and Prevention
http://www.cdc.gov/
1-800-311-3435

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

Deapartment of Justice, Office for State and Local Domestic Preparedness Support
http://www.ojp.usdoj.gov/osldps
(202) 305-9887

U.S. Army Medical Research Institute for Infectious Diseases
http://www.usamriid.army.mil/

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

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

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

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