

# Chapter 23

## DOMESTIC PREPAREDNESS

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## INTRODUCTION

Major emergencies like the terrorist attacks of September 11, 2001, and the following anthrax mailings, as well as the devastating effects of Hurricane Katrina and the emerging threat of avian influenza are currently fresh in Americans' memories. Military healthcare providers have a role in responding to national events, whether terrorist attacks, natural disasters, or emerging diseases. This chapter outlines the organizational framework within which military healthcare providers will operate. The following pages will discuss how military healthcare providers are expected to interact with local, state, and federal agencies while remaining in a military chain of command when reacting to national emergencies. The strategy and primary goal of federal and civilian counterterrorism agencies is to deter attacks. Natural catastrophes and human-made

accidents require diligence in awareness and preparedness activities to coordinate operations, prevent and safeguard lives, and protect economic interests and commodities.

This is an introduction to national measures and policies as well as to medical resources, training, and exercises available to military healthcare providers. Effective information flow is crucial to the success of a proper and well-organized emergency response for chemical, biological, radiological, nuclear, or explosive (CBRNE) incidents. Learning about the military healthcare provider's role in preparing for such an event and becoming familiar with the organizational framework and expectations of disaster preparedness results in a healthcare force that is prepared to assist in the biomedical arena of national defense.

### NATIONAL CIVILIAN PREPAREDNESS (1990–2001)

The fundamental tenet of disaster response in the United States is that disasters are local. As a result, local authorities are primarily responsible for responding to incidents, whether natural or human-made. However, state and regional authorities and assets can assist upon request from the local governing body and federal assets can assist upon request of the state governor. Most states authorize either a city council, board of supervisors, or other authority sanctioned by a local ordinance to request help should a local government be unable to handle a disaster. This local governing body, or "incident command system," can request state aid. Prior to 2001 domestic preparedness efforts at local, state, and federal levels were often poorly coordinated and disruptive because of disputes over authority, particularly when legal and recovery priorities clashed. Existing federal legislation and policy was comprehensive but inconsistent and did not adequately address the full range of antiterrorism and counterterrorism actions necessary to deal with the risk of, or recovery from, a major terrorist action using chemical, biological, or nuclear weapons of mass destruction (WMDs). Disasters and terrorist attacks can take on many forms and preparedness plans require measuring risk against the potential for damage.

Incidents such as the bombings of the World Trade Center in 1993, Oklahoma City's Murrah Federal Building in 1995, and Atlanta's Olympic Centennial Park in 1996 and the Tokyo sarin attack in 1995 all highlighted inadequacies in capability and readiness to avert and manage large-scale terrorist events. Review of the events resulted in agencies understanding the importance of a coordinated response and the impact of proper communication on positive outcomes. The

above experiences led to a series of policies designed to ensure interagency coordination and communication. However, these policies are complicated, which may partially explain the degraded state of coordination and communication between agencies when the September 11, 2001, attacks occurred.

After the sarin gas attacks in Tokyo and the Oklahoma City bombing, President Bill Clinton signed presidential decision directives 39 and 62.<sup>1,2</sup> These directives outline policy for deterring and responding to terrorism through detecting, preventing, and managing WMD incidents. *Presidential Decision Directive 39* also defines domestic and international threats and separates the nation's response to these events into what are called "crisis responses" and "consequence management responses." Crisis responses involve proactive, preventative operations intended to avert incidents and support post-event law enforcement activities for legal action against the perpetrators. Consequence management refers to operations focused on post-incident activities intended to assist in damage recovery. This phase of recovery includes tasks such as restoring public services, safeguarding public health, offering emergency relief, providing security to protect casualties, staffing response agencies, and guaranteeing information flow and infrastructure stability.

In Public Law 104-201 (the National Defense Authorization Act for Fiscal Year 1997, Title XIV, "Defense against Weapons of Mass Destruction," commonly referred to as the "Nunn-Lugar-Domenici legislation"), Congress implemented presidential decision directives 39 and 62, which directed and supported an enhanced federal effort toward preventing and responding to terrorist incidents.<sup>3</sup> One of these

efforts led to the formation of a senior interagency group on terrorism, chaired by the Federal Emergency Management Agency (FEMA). This group coordinated federal policy issues among agencies and with state and local governments.<sup>4</sup> At this time the Department of Defense (DoD) outlined its responsibilities, oversight, and execution plan aimed at preparedness and response.

Section 1412 of Title XIV directed and equipped the secretary of defense to carry out a program providing civilian personnel of federal, state, and local agencies with training and expert advice regarding emergency responses to the use or threatened use of a WMD or related materials.<sup>3</sup> This policy became known as the “120 Cities Program” and focused on improving coordination between emergency response planners and executors at the 120 largest metropolitan centers in the United States. Section 1413 directed and equipped the secretary of defense to coordinate DoD assistance to federal, state, and local officials when responding to threats involving biological or chemical weapons (or

related materials or technologies) and to coordinate with the Department of Energy for similar assistance with nuclear weapons and related materials.<sup>3</sup> Section 1415 directed and equipped the secretary of defense to develop and carry out a program for testing and improving federal, state, and local responses to emergencies involving biological weapons and related materials. Section 1416 directed limited DoD support to the attorney general and civilian law enforcement in emergency situations involving biological or chemical weapons.<sup>3</sup> The preexisting Federal Response Plan assigned specific emergency support functions (ESFs) to the DoD in the event of a local incident of sufficient magnitude to involve federal assets. Public Law 104-102 therefore expanded and clarified the DoD’s responsibilities to prepare the nation’s emergency response assets for a chemical, biological, or radiological incident and also clarified the nature of the DoD’s cooperative relationships with other agencies. In 1999 many of those responsibilities transferred to the US Department of Justice.

### DOMESTIC PREPAREDNESS AFTER SEPTEMBER 11, 2001

By September 11, 2001, many domestic preparedness initiatives and programs were already in place, but a coordinated response effort was lacking.<sup>3,5,6</sup> The response following September 11, 2001, demonstrated gaps in existing policy and practice as well as the need for a more expanded approach, more unified structure, and closer coordination. Creating the White House Office of Homeland Security on Oct 8, 2001, was the first step toward improving the US emergency response posture. The office published the *National Strategy for Homeland Security* in July 2002. This strategy provides guidelines and a framework by which the federal, state, and local governments, as well private companies and civilians, can organize a more cohesive response network for the nation. As part of the strategy, President George W Bush established the US Department of Homeland Security (DHS) in June 2002 to unite efforts across different agencies involved in homeland security and “clarify lines of responsibility for Homeland Security in the Executive Branch.”<sup>7</sup>

#### National Strategy for Homeland Security and Homeland Security Presidential Directives

On October 29, 2001, *Homeland Security Presidential Directive 1* was issued, becoming one of the first directives to increase the security of US citizens by organizing a homeland security council.<sup>8</sup> The homeland security council’s overarching role is to ensure there is coordination between all executive agencies (eg, secretary of defense, US Department of Health and Human

Services [DHHS], US Federal Bureau of Investigation, DHS, etc) involved in activities related to homeland security. *Homeland Security Presidential Directive 3* was issued in March 2002, directing the homeland security advisory system to provide a comprehensive means to disseminate information regarding terrorist acts.<sup>9</sup> This system, administered by the DHS, provides current information related to threats and vulnerabilities and provides the information to the public. The DHS communicated this information by means of a color-coded threat condition chart (Figure 23-1).<sup>9</sup>

With more than 87,000 distinct jurisdictions, the United States faces a unique challenge when coordinating efforts across federal, state, and local governments. In February 2003 the president issued *Homeland Security Presidential Directive 5*.<sup>10</sup> This directive established the DHS as the lead federal agency for domestic incident management and homeland security. The secretary of homeland security coordinates the federal government’s resources to prevent, prepare for, respond to, and recover from natural and human-made disasters. The *National Strategy for Homeland Security* provides the direction and framework for all government agencies to follow that have roles in homeland security.<sup>7</sup>

#### National Incident Management System and the National Response Plan

In 2003, under *Homeland Security Presidential Directive 5*, the secretary of homeland security was tasked to develop and administer the National Incident



**Fig. 23-1.** The National Homeland Security Advisory System. The five threat conditions are outlined in Homeland Security Presidential Directive 3. Reproduced from: US Office of Homeland Security. Homeland Security Advisory System. Washington, DC: Office of the Press Secretary; 2002. Homeland Security Presidential Directive 3.

Management System (NIMS)<sup>10,11</sup> and the National Response Plan (NRP).<sup>12</sup> The NIMS outlines how federal, state, local, and tribal communities will prevent, prepare for, respond to, and recover from domestic incidents. The NRP encompasses the NIMS and provides the structure and operational direction for the coordinated effort. All federal agencies are required to use NIMS in their domestic incident management and emergency programs. NIMS outlines a nationwide approach for federal, state, and local governments and agencies for use in command and multiagency coordination systems. It also outlines training and plans for resource management, as well as components that are used to facilitate responses to domestic incidents. These components include command and management, preparedness, resource

management, and communications and information management.<sup>11</sup>

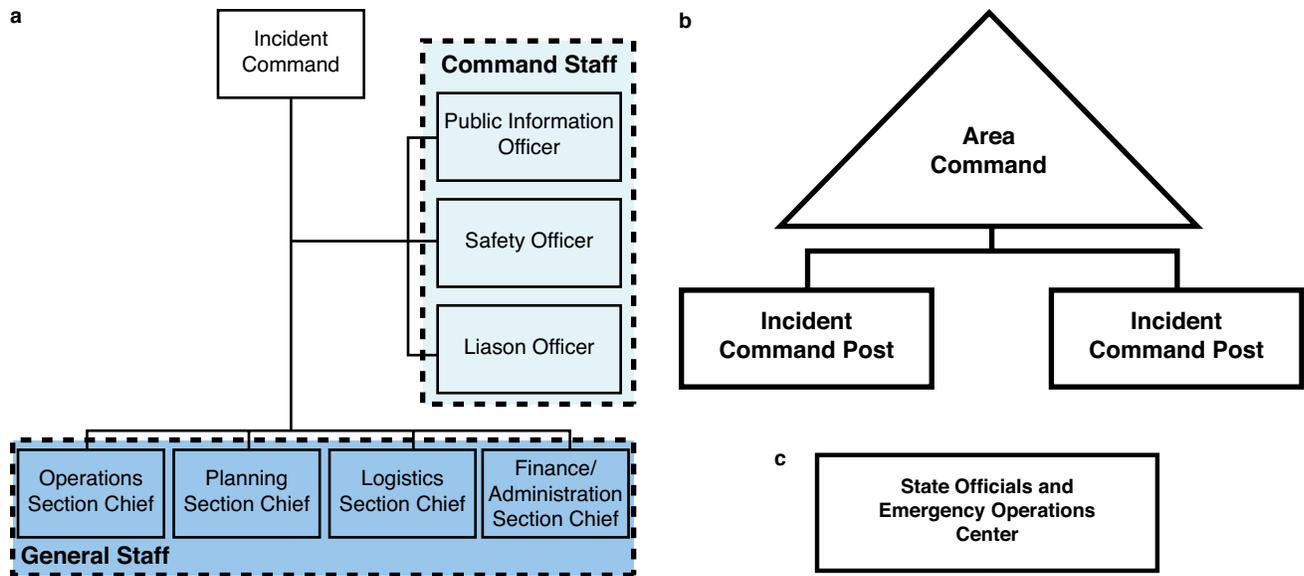
The command and management component of NIMS emphasizes structure (incident command systems) and organization (multiagency coordination systems) and has an additional role in informing the public of an incident. These systems involve every level of government, including DoD, with the optimum goal of facilitating management and operations. The overall structure and template for the command and management section outlines a unified command under an incident command and staff. With a unified command, no agency's legal authority is compromised and a joint effort across all agencies is achieved.

This "national domestic all-hazards preparedness goal" provides for incident-specific resources.<sup>13</sup> The preparedness component of NIMS is made up of activities that include planning, training, exercises, personnel qualification and certification, equipment acquisition and certification, mutual aid, and publications management. This component represents the focus of many jurisdictional levels and crosses many agencies that are responsible for incident management.<sup>11</sup>

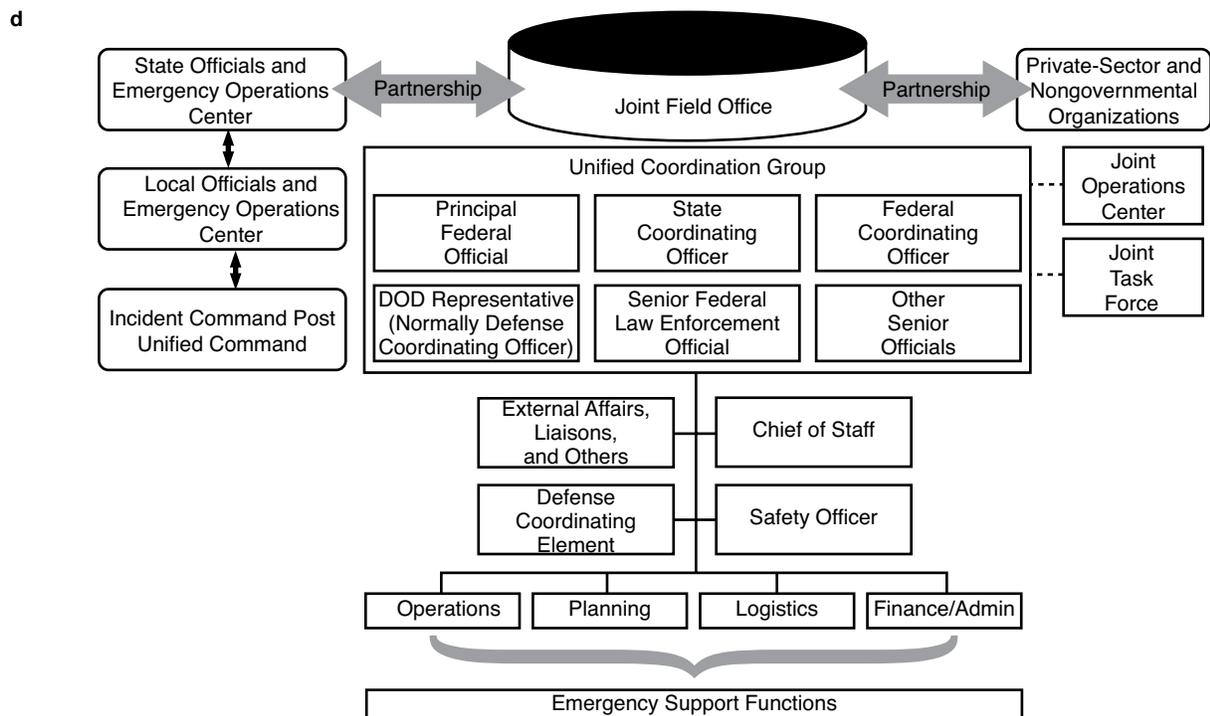
NIMS unifies incident-management and resource-allocation. Under NIMS, preparedness encompasses the full range of deliberate and critical activities necessary to build, sustain, and improve the operational capability to prevent, protect against, respond to, and recover from domestic incidents. Preparedness, in the context of an actual or potential incident, involves actions to enhance readiness and minimize impacts; it includes hazard-mitigation measures to save lives and protect property from the impacts of events such as terrorism and natural disasters.<sup>12</sup>

Preparedness requires a well-conceived plan that encompasses emergency operations plans and procedures. NIMS outlines how personnel, equipment, and resources will be used to support incident management.<sup>11</sup> The plan includes all entities and functions that are critical to incident management, such as priorities and the availability of resources.<sup>11,12</sup> NIMS training and exercise activities outline multiagency standard courses that cross both agent-specific and discipline-specific areas. Exercises focus on all actively participating jurisdictions and agencies and on disciplines working and coordinating efforts and optimizing resources. These kinds of exercises allow for improvements built on experience.<sup>11-13</sup>

The NRP superseded the Federal Response Plan and several other earlier plans and provided for a more unified effort.<sup>12</sup> The NRP outlined and integrated the federal government's domestic prevention, preparedness, response, and recovery plans across many disciplines and hazards.



**Fig. 23-2.** Organizational outline for incident management command. The structures address local, field, state and joint field office national incident response organization. **(a)** Local responders use the incident command structure. **(b)** Field-level area command structure. **(c)** State and emergency operations center. **(d)** Overview of the joint field office and its key components  
 Reproduced from: US Department of Homeland Security. *National Response Framework*. Washington, DC: DHS; 2008.



## National Response Framework

In 2008 the NRP will be replaced by National Response Framework (NRF), which will guide the nation in incident response. The NRF ensures that government executives and nongovernment organizations, leaders, emergency management personnel, and the private segments across the country understand domestic incident response roles.

The NRF provides a structure for implementing national-level policy and operational coordination for domestic incident response. The NRF addresses actual or potential emergencies, hazard events (ranging from accidents to natural disasters), and actual or potential terrorist attacks. These incidents could range from modest events that are contained within a single community to ones that are catastrophic and create national consequences.

The NRF includes a wider incident audience than the NRP, including executive leadership, emergency management personnel at all government levels, and private community organizations and other nongovernmental organizations. It has expanded the focus on partnership, affirming that an effective national response requires layered and mutually supporting capabilities. Local communities, tribes, and states are primarily responsible for the safety and security of their citizens. Therefore local leaders will build the foundation for response and communities will prepare individuals and families.

The NRF has made many changes to the NRP, including updating the planning section and improv-

ing annexes and appendices. It clarifies the roles and responsibilities of the principal federal official, federal coordinating officer, senior federal law enforcement official, and the joint task force commander (Figure 23-2). The NRF describes organizational structures that have been developed, tested, and refined that are applicable to all support levels. The response structures are based on the NIMS and they promote on-the-scene initiative and resource sharing by all levels of government and private sectors. At the field level, local responders use the incident command structure to manage response operations (see Figure 23-2a). There may be a need for an area command structure at this level, which may be established to assess the agency administrator or executive in overseeing the management of multiple incidents (see Figure 23-2b). On-scene incident command and management organizations are located at an incident command post at the tactical level. State emergency operations centers are located where multi-agency coordination can occur and they are configured to expand as needed to manage state-level events (see Figure 23-2c).

The joint field office is the primary federal incident management field structure and is composed of multiple agencies. It serves as a temporary facility for coordinating federal, state, local, tribal, public, and private agencies responsible for response and recovery. The joint field office is organized in a manner consistent with NIMS principles and is led by the unified coordination group (Figure 23-3). It focuses on providing support to on-the-scene efforts and supporting operations beyond the incident site.<sup>13</sup>

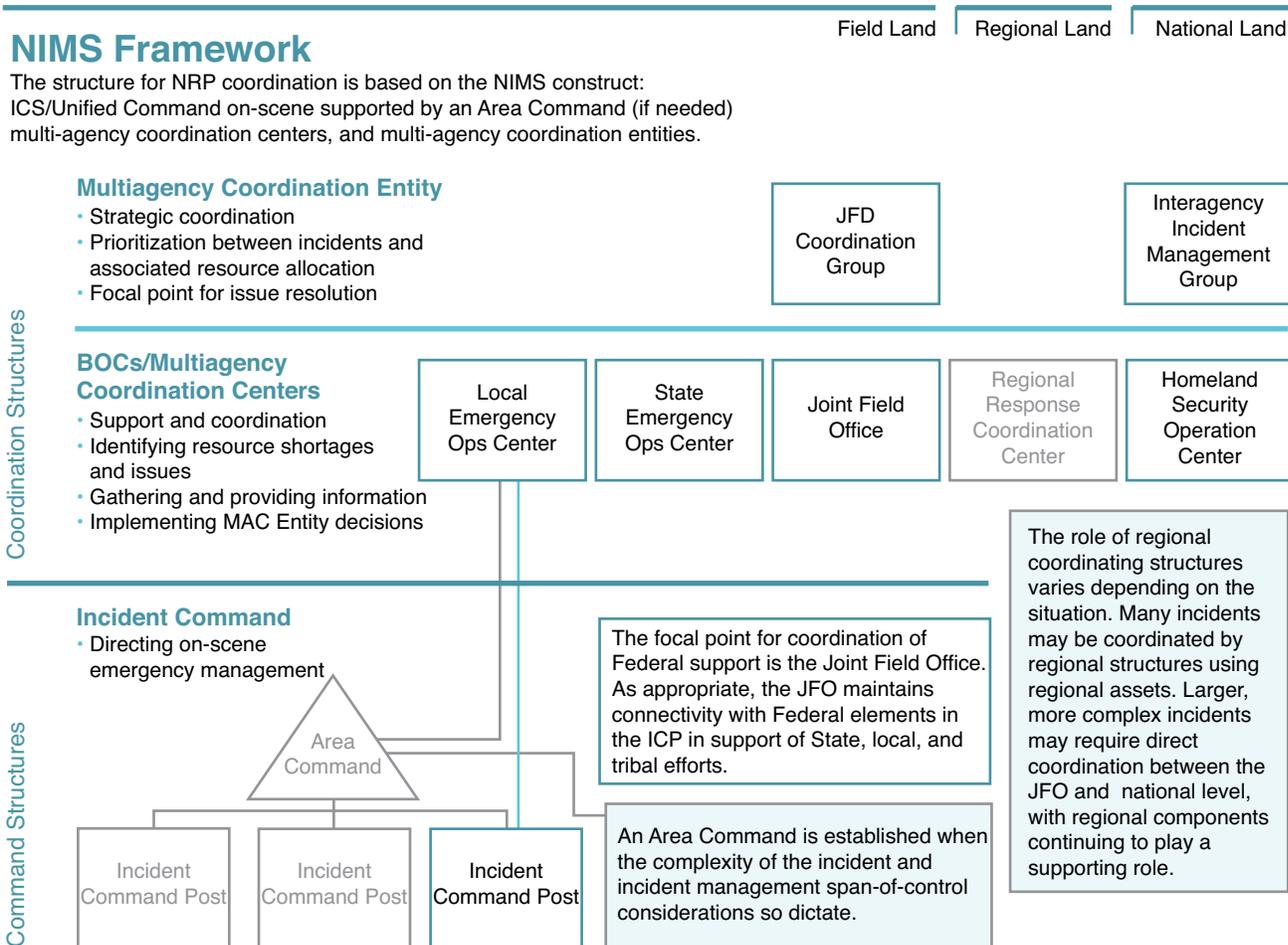
## DEPARTMENT OF DEFENSE ROLES FOR DOMESTIC PREPAREDNESS AND RESPONSE

The *Quadrennial Defense Review Report* of 2006 outlines new challenges facing the DoD. This report examines four priority areas of homeland defense and protection against WMDs.<sup>14</sup> The DoD has unique capabilities and resources that can be used to support a federal response should an incident occur. Within the roles and responsibilities of the NRF, the secretary of defense, as directed by the president, can authorize defense support for civil authorities (in the form of an official request for assistance during a domestic incident).<sup>13</sup> Although the secretary of homeland security is the principal federal agent during an incident of national significance, command and control authority for military assets remains within military chains of command.

The DoD, through the secretary of defense, has two roles with respect to domestic preparedness. First, the DoD's mission is to defend US territory and its interests. Its second role is providing military support to civilian authorities when directed by the president,

who can authorize the military to defend nonDoD assets that are designated as critical. The *Strategy for Homeland Defense and Civil Support* guides DoD action in each role.<sup>15</sup> This document builds on several others, including the *National Defense Strategy of the United States of America*,<sup>16</sup> the *National Strategy for Homeland Security*,<sup>7</sup> and the *National Security Strategy of the United States of America*.<sup>17</sup> The *Strategy for Homeland Defense and Civil Support* has several objectives. These include interdicting and defeating threats at a safe distance, providing mission assurance, supporting civil authorities in CBRNE attacks, and improving capabilities for homeland defense and security.<sup>15</sup> Overall, policy guidance and supervision to homeland defense activities are the responsibility of the assistant secretary of defense for homeland defense.

In the case of an emergency of national significance, the NRP outlines federal department or agency support to state or local governments.<sup>12</sup> The actions of federal agencies are dictated by the Stafford Act



**Fig. 23-3.** Organizational outline for incident management command and coordinating centers. The structure addresses local (or field) to national incident management. Gray areas are established when the complexity of the incident has expanded. Blue areas indicate the national structure for managing the incident, establishing a clear progression of coordination and communication from the local level to the national headquarters level.

Reproduced from: US Department of Homeland Security. National Response Plan. Washington, DC: DHS; 2004.

EOC: emergency operations center

ICS: incident command system

JFO: joint field office

MAC: multiagency coordination

NIMS: National Incident Management System

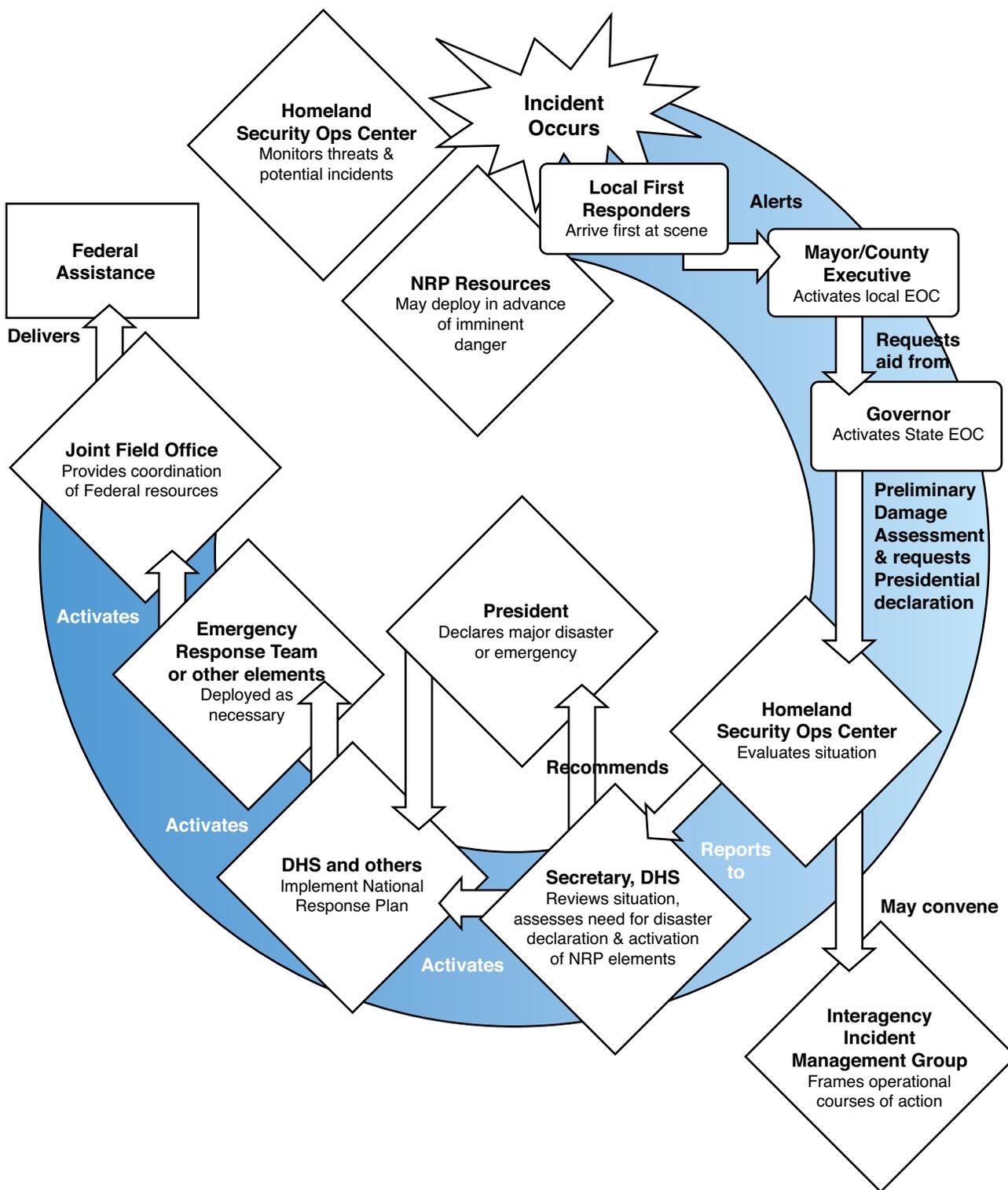
NRP: National Response Plan

Ops: operations

(Figure 23-4).<sup>12,18</sup> The initial response is handled locally using available resources. After expending those resources, the local jurisdictions notify the state. State officials review the situation and respond by mobilizing state resources, keeping DHS and FEMA regional offices informed. When the situation becomes of such a magnitude that the governor requests a presidential directive for more support, regional staffing is coordinated using deployments, such as emergency response teams. A federal coordinating officer from the DHS

identifies requirements and coordinates the overall federal interagency management.<sup>12</sup>

DoD's role in a domestic emergency depends on the scope of the incident, but it executes its responsibilities under the NRP, either as lead agency or in support of other lead agencies.<sup>12</sup> The DoD may first become involved in a limited role in small contingency missions, working with or under leading agencies. If the emergency is more serious (eg, a major natural disaster or a terrorist event), large-scale or specific, the DoD will



**Fig. 23-4.** Overview of initial federal involvement under the Stafford Act. The flowchart illustrates a course of action local and state governments may take during an emergency to request assistance from federal agencies.

Reproduced from: US Department of Homeland Security. *National Response Plan*. Washington, DC: DHS; 2004.

EOC: emergency operations center

NRP: National Response Plan

Ops: Operations

most likely be required to respond and may be asked to provide its unique capabilities to assist other agencies.

For emergencies involving chemical or biological weapons that overwhelm the capabilities of local, state, or other federal agencies, the DoD directly supports and assists in the areas of monitoring, identifying, containing, decontaminating, and disposing of the weapon. Specific NRP incidence annexes outline

contingency plans for response to incidents involving biological, radiological, or chemical agents and toxic industrial chemicals and materials.<sup>12</sup> Although the coordinating agency may not be the DoD, the department is involved in these incidents because of its specialized training and capabilities. These unique DoD capabilities, specifically in the areas of programs and assets, are the focus of the remainder of this chapter.

## THE DEPARTMENT OF DEFENSE'S SUPPORT TO CIVIL AUTHORITIES

The events of the 1995 sarin gas attack in the Tokyo subway, as well as threats against the United States and its allies, substantiated the need for planning to mitigate a chemical attack on the United States. This need became more evident with the continued threat and possible use of chemical weapons by Iraq and the former Soviet Union. The potential for exposure exists because many countries still maintain access to, or stockpiles of, chemical warfare agents. The continued threat of accidental or intentional incidents resulting from human-made disasters following the release of toxic industrial chemicals or materials has necessitated efforts to develop streamlined, rapid responses to chemical events. In an effort to provide information to the public, other agencies, and authorities, the Centers for Disease Control and Prevention (CDC) has compiled a comprehensive and extensive list of toxic chemicals and chemical agents, chemical characteristics, and medical first aid and antidote treatment.<sup>19</sup> The anthrax attacks of 2001 and the potential use of biological weapons make emergency planning necessary. Multiagency planning is also required to prepare for potential nuclear incidents.

The DoD is uniquely capable of responding to these events because of wartime experience, continued research to counteract WMDs, and ongoing training in protective measures. Since the use of chemical weapons in World War I and the establishment of a chemical warfare service in 1918, the DoD has continued to be involved in developing countermeasures (antidotes, protective equipment, etc) through research, training, and initiating new programs, resources, and centers of authority.<sup>20</sup> Today challenges for the DoD include incorporating these capabilities into homeland security and coordinating these efforts with other agencies and the civilian incident commands.

The National Response Framework ESF 8 ("Health and Medical Services") outlines coordination guidelines for the DHHS, the lead agency during a domestic incident, as well as all signatory supporting agencies, including the DoD.<sup>4,13</sup> The NRF states that the DHHS and the US Department of Agriculture are the coordinating agencies for the food and agriculture incident

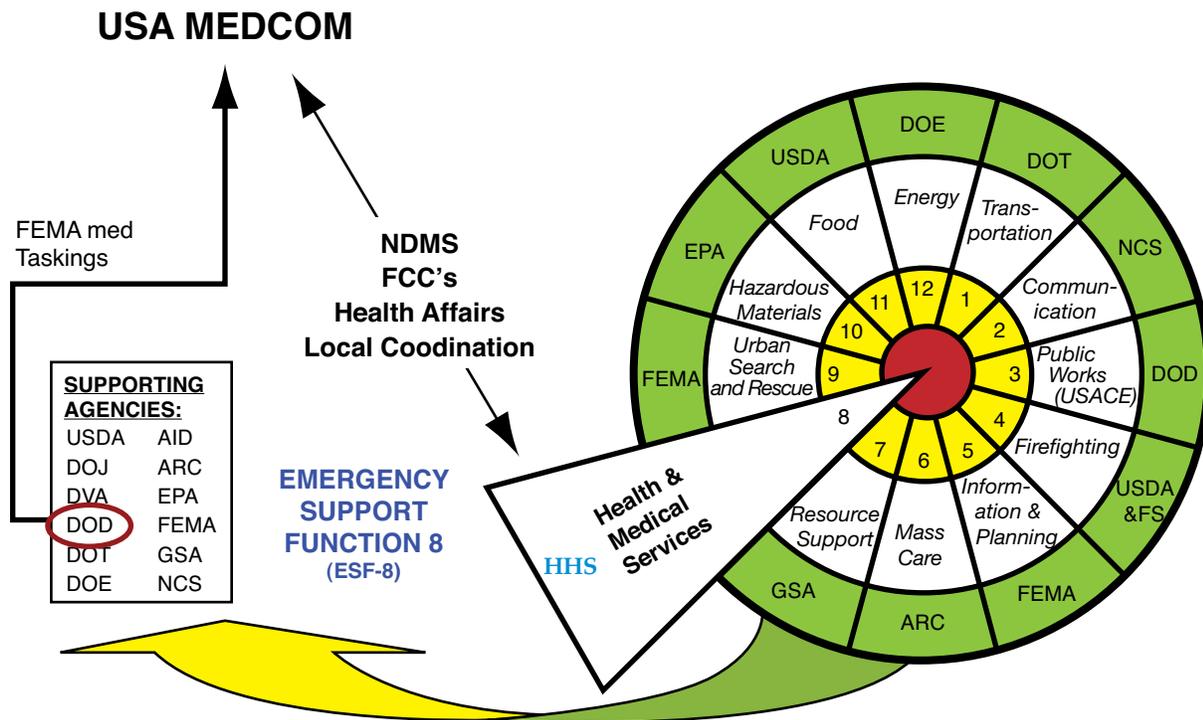
annex. In this capacity, the military contributes only a supporting role to civilian authority. The DoD military operations that have priority over disaster relief<sup>12,13,16,21</sup> are also defined in ESF 8 (Figure 23-5).

Defense support in a domestic incident can involve federal military forces and DoD civilians and contractors, as well as other DoD components. The executive authority for military support is through the secretary of defense, who can authorize defense support of civil authorities. The secretary of defense retains the command of military forces throughout operations.<sup>16,21</sup> The secretary of defense also designates the secretary of the Army as the DoD executive agent for military support to civil authorities, and the point of contact for the DoD executive agent is the defense coordinating officer. This individual is the DoD's representative at the joint field office. For a domestic incident in which DoD assistance is needed, the defense coordinating officer forwards a request for assistance to the US Army Northern Command, which passes the request to the US Army Medical Command (MEDCOM) and the commander of the US Army Forces Command. If the disaster exceeds the defense coordinating officer's command and control, a supporting military commander-in-chief establishes a joint task force or response task force to control DoD assets and resources (including personnel).<sup>21</sup>

The DoD's role in supporting emergency response operations depends on well-trained, readily available, fully qualified personnel. These personnel are often from different commands and services within the DoD. In addition, active, reserve, and National Guard components can be made available for domestic support, depending on the extent and nature of the incident and the forces' current deployment missions throughout other regions of the world.

The capabilities of the DoD and the military to react to a CBRNE event are described in terms of "detection and response" and "reach-back response."<sup>15</sup> The detection and response capability provides teams trained in detection, initial response, and medical response. The initial response to a domestic incident is often the most crucial step and sets the stage for a well-executed and effective overall response. These

## Federal Emergency Response Plan



**Fig. 23-5.** Federal emergency response plan outlining federal government departments and their interactions with supporting agencies, such as the Department of Defense. Reproduced from: US Department of the Army. Medical Emergency Management Planning. Washington, DC: DA; 2003. MEDCOM Pam 525-1.

AID: Agency for International Development  
 ARC: American Red Cross  
 DoD: Department of Defense  
 DOE: Department of Energy  
 DOJ: Department of Justice  
 DOT: Department of Transportation  
 DVA: Department of Veteran’s Affairs  
 EPA: Environmental Protection Agency  
 FCC: federal coordinating center

FEMA: Federal Emergency Management Association  
 FS: Forest Service  
 GSA: General Services Administration  
 HHS: Department of Health and Human Services  
 NCS: National Communications System  
 NDMS: National Disaster Medical System  
 USACE: United States Army Corps of Engineers  
 USA MEDCOM: US Army Medical Command  
 USDA: US Department of Agriculture

military first responders are important assets in supporting homeland defense.

In 1996, based on *Presidential Decision Directive 39*, the Marine Corps developed a task force uniquely trained for CBRNE incidents.<sup>1,22</sup> This forward-support task force, called the “chemical/biological incident response force” (CBIRF), is a mobile, self-sufficient response force capable of deploying rapidly.<sup>1</sup> CBIRF focuses its efforts on consequence management. The team is trained to function in several roles as initial responder; for example, it is trained in decontamination, security, and medical responder assistance during specific or unique incidents, such as CBRNE

events.<sup>22-24</sup> Currently CBIRF is located in the national capital region.

CBIRF is a consequence management force that can deploy on short notice when directed by the national command authority. The force consists of several elements, including reconnaissance (with a nuclear, biological, and chemical [NBC] element), decontamination, medical support, security, and service support. Each element includes up to 120 Marines (eg, a security element), but most elements consist of about 30 personnel. CBIRF’s medical element is made up of 6 officers (3 physicians, 1 environmental health officer, 1 physician assistant, and 1 nurse) and

17 corpsmen. All elements train and certify in their respective areas. They are required to attend unique training, such as the Medical Management of Chemical and Biological Casualties Course or the Contaminated Casualty Decontamination Course given through the US Army Medical Research Institute of Chemical Defense (USAMRICD) in conjunction with US Army Medical Institute of Infectious Disease (USAMRIID). CBIRF members are also NBC-qualified by the US Marine Corps Forces, NBC School in Atlanta, Georgia. The CBIRF can provide expert advice to an incident commander by means of a reach-back capability to military and civilian scientific experts.<sup>22-24</sup> This means that through networking and communication, CBIRF elements “reach back” to other DoD assets or consulting experts on specific information related to chemical or biological threats. This reach-back capability results in rapid and coordinated effort.<sup>22-24</sup>

The National Guard’s role in a domestic CBRNE event is to support state governors and fully integrate within CBRNE operations.<sup>15</sup> The Army National Guard is currently composed of over 360,000 individuals, while the Air National Guard has approximately 109,000. The National Guard, organized by the DoD, also coordinates its efforts across many other federal agencies.<sup>25</sup> When called up by the state governor, the guard provides initial security and response for up to 24 hours, after which WMD civil support teams mobilize. The National Guard has at least 55 WMD civil support teams that are equipped and trained to detect CBRNE agents. These teams are early entry forces equipped with diagnostic equipment for detecting CBRNE weapons, they are trained and equipped for decontamination, and they can provide emergency medical treatment. Depending on the mission, they can also assist other early responders and advise the incident commander.<sup>22,25</sup>

In March 2004 the joint chiefs of staff and the commander of the US Army Northern Command supported forming National Guard CBRNE-enhanced response force packages for CBRNE missions. The packages use existing capabilities combined with specialized training and equipment and are designed to support domestic missions for state governors, but are also able to support joint expeditionary capabilities.<sup>23,25</sup> The future vision for these integrated CBRNE forces is for them to work closely with other agents within the DoD, including the chemical corps, Northern Command, and other state and federal agencies. The National Guard is committed to supporting civil authorities in homeland security missions as well as serving as a first-line military capability to support homeland defense.<sup>25</sup>

The 20th Support Command was initiated in Octo-

ber 2004 and is structured out of the forces command under the US Joint Forces Command. The 20th supports a wide spectrum of CBRNE operations with fully trained forces. It is capable of exercising command and control in these operations. The 20th Support Command includes personnel from the chemical corps, technical escort unit, and the explosive ordnance disposal. Within this command structure, support continues to come from and go to MEDCOM.<sup>26,27</sup> There is currently an ongoing effort within the DoD to expand the 20th Support Command to serve as a joint task force capable of immediate deployment on WMD elimination and exploitation missions.<sup>14</sup>

The US Army’s First and Ninth area medical laboratories (AMLs) also support forces’ command missions. These two units, based out of Aberdeen Proving Ground, Maryland, are capable of deploying anywhere in the world on short notice to conduct health-hazard surveillance. The units draw on the scientific expertise of surrounding organizations in many areas, such as the US Army Center for Health Promotion and Preventive Medicine (USACHPPM), USAMRICD, and USAMRIID.

The AMLs conduct health-hazard surveillance for biological, chemical, nuclear, radiological, occupational and environmental health, and endemic disease threats at the theater level to protect and sustain the health of forces throughout military and domestic support operations. Using sophisticated analytical instruments combined with health risk assessment by medical and scientific professionals, the AMLs confirm environmental exposures in the field associated with the contemporary operating environment. The execution of this mission provides combat commanders with critical information that can assist in mitigating or eliminating health threats during the operational risk management process.

The AMLs are composed of personnel with military occupational specialties from the areas of occupational and environmental health, NBC exposure, and endemic disease.<sup>27,28</sup> The AMLs were structured from the original 520th Theater Army Medical Laboratory and maintain a chain of command through the 44th MEDCOM. This structure enables the units to provide comprehensive health hazard surveillance typically associated with MEDCOM-fixed facilities.<sup>26,28</sup>

The occupational and environmental health section of the AML provides comprehensive environmental health threat assessments by conducting air, water, soil, entomological, epidemiological, and radiological surveillance and laboratory analyses. In support of this mission, the occupational and environmental health section conducts analysis in four areas: environmental health, industrial hygiene, radiological assessment,

and entomology.<sup>27,28</sup>

Some of the capabilities of the NBC section include cholinesterase activity measurement, microbial identification, and gas chromatography with mass selective detector. Other instrumentation capabilities include an electron capture and flame photometric detector, a mobile laboratory, and telechemistry. These capabilities allow the section to identify microbial organisms and monitor for chemical WMDs as well as for a wide variety of toxic industrial chemicals. The technicians of the NBC section work in an isolation facility. Soldiers set up the isolation facility using a tactical, expandable, two-sided, shelter attached to two sections of an extendable, modular, personnel tent (called a "TEMPER"), and some of the capabilities can be executed in the mobile laboratory mounted in a shelter unit on the back of a M1097 HMMWV troop carrier.<sup>29-31</sup>

Upon request, the endemic disease section deploys worldwide to conduct health threat surveillance for biological warfare agents and endemic disease threats at the theater level and provides and sustains force health protection. The section sets up its laboratory in an isolation facility that is nearly identical to that of the NBC section. This section is self-supporting and

capable of transporting tactical and technical equipment, providing environmental control, and using power generation equipment in order to complete assigned missions. The endemic disease section relies primarily on nucleic acid and antigen-detection-based technologies, along with basic microbiological techniques, to detect, identify, and analyze naturally occurring infections and biological warfare agents that may be encountered during deployments.

The endemic disease section often includes professional officer filler information system (PROFIS) personnel, such as veterinary pathologists, veterinary microbiologists, preventative medicine physicians, and infectious disease physicians. The PROFIS system is designed to provide high-quality medical care through trained medical personnel. Medical personnel are required to provide healthcare to fixed medical treatment facilities and deploying units. PROFIS personnel within the 20th Support Command serve as subject matter experts on issues regarding infectious disease and biological warfare agents. They also provide laboratory support for infectious disease outbreak investigations and process and analyze potentially dangerous infectious specimens.<sup>28</sup>

#### MILITARY HEALTHCARE'S ROLE IN DOMESTIC PREPAREDNESS

MEDCOM also has multiple resources that can assist in responding to domestic incidents, such as those described in MEDCOM pamphlets 525-1 and 525-4.<sup>21,32</sup> These regulations outline potential medical support to civil authorities and provide guidance on developing plans for MEDCOM's response to emergencies related to WMDs (see Figure 22-5). In the case of a major disaster or emergency, DHHS, as the primary agency for health and medical services, would notify all supporting agencies under ESF 8. Each agency would be responsible for supplying sufficient support to any activities tasked against it and must therefore have a support individual or individuals knowledgeable in the resources and capabilities of its respective agency.<sup>21</sup>

The US Joint Forces Command communicates with other agencies to provide requests for assistance. In addition, MEDCOM, when directed to conduct emergency medical assistance, provides personnel through PROFIS. These individuals are deployed as directed by the Northern Command via forces command and they are recalled according to their tables of organization. Additional assistance can come from other support functions, medical treatment facilities, or other DoD medical forces, active or reserve.<sup>21</sup>

One support function of the Army Medical Department is special medical augmentation response teams.

These teams are organized at the subordinate MEDCOMs, such as USACHPPM and the US Army Medical Research and Materiel Command. There are 38 special medical augmentation response teams, two of which are particularly important in response to a chemical incident. These are the preventive medicine and the NBC teams. Teams are made up of military personnel, civilians, and DoD contractors and can be deployed within or outside the continental United States to support local, state, or federal agencies in response to an emergency within 12 hours of notification.<sup>21,23,32</sup>

The chemical and biological rapid response team is another asset. The National Medical Chemical and Biological Advisory Team, which serves as the principal DoD medical advisor to the commanders or political authorities in response to a threat, directs this element. Chemical and biological rapid response teams are capable of deploying within 4 hours of notification and they provide technical support by means of an advisory team that is tasked to an incident site.<sup>22,23</sup> Other MEDCOM support personnel include the radiological advisory medical teams located at Walter Reed Army Medical Center in Washington, DC; the disaster assistance response team located at Madigan Army Medical Center in Tacoma, Washington; and the emergency medical response team located at Tripler Army Medical Center in Honolulu, Hawaii.<sup>21,22</sup>

## NATIONAL PREPAREDNESS PROGRAMS AND INITIATIVES

In addition to personnel and resources, there are several programs or initiatives that coordinate domestic preparedness efforts or respond proactively to incidents. Some of these include the National Disaster Medical System (NDMS), the Strategic National Stockpile (SNS), and the Laboratory Response Network.

### National Disaster Medical System

The objective of the NDMS is to coordinate a cooperative agreement between federal agencies, including the DHHS, the DoD, the DHS, and the Department of Veterans Affairs, as well as state, local, public, and private resources to ensure a coordinated medical response system. The NDMS is activated in response to emergency events and provides potential assets to meet medical health services as outlined in ESF 8 in the NRP.<sup>11,12</sup> FEMA coordinates necessary medical care for incidents such as natural catastrophes, military contingencies, terrorist attacks, or refugee influxes. The response is federalized, with the DHHS acting as the lead federal agency. Medical care personnel include disaster medical assistance teams, disaster mortuary teams, veterinary medical assistance teams, and WMD medical response teams.<sup>18,21</sup> The MEDCOM NDMS coordinates efforts with the NDMS within a geographical area.

### Strategic National Stockpile

The treatment of mass casualties involved in a biological or chemical terrorist attack requires not only a coordinated effort of personnel but may also include large quantities of pharmaceuticals and medical supplies. Because an attack could occur at any time or place, life-saving resources require an equally coordinated response. In most scenarios, state and local governments do not have sufficient quantities of medical items to provide for a mass-casualty event, so effective pharmaceuticals must be rapidly deployed from a central location. This need led to the creation of a national stockpile.

In 1999 Congress directed that the DHHS and the CDC establish a national repository of antibiotics, pharmaceuticals, chemical antidotes, and other medical supplies. Identified as the "National Pharmaceutical Stockpile," the mission of this repository is to provide these items during an emergency within 12 hours of a federal decision to deploy.<sup>33</sup> With the approval and passage of the Homeland Security Act of 2002, the role of determining the goals and requirements of the National Pharmaceutical Stockpile shifted to the DHS.

In March of 2003 the act's name was changed to the "Strategic National Stockpile Program," and oversight and guidance of the pharmaceuticals and the program transferred returned to the DHHS and the CDC to ensure that there are enough life-saving pharmaceuticals and medical supplies available in an emergency.

The SNS supplements the initial actions of first responders from state and local public health agencies. "Push packages" of pharmaceuticals and supplies are deployed within 12 hours of a request. The 12-hour push packages are composed of broad-spectrum items that can treat or provide symptomatic relief from a variety of ill-defined or yet-to-be-determined illnesses. If required, additional supplies or products specific to an incident can be obtained through a vendor-managed inventory. These items can be shipped to the community or incident site within 24 to 36 hours.

Both the DHHS and CDC determine and maintain the SNS assets. Decisions on which treatments or antidotes to maintain are based on intelligence reports, vulnerability of the population, availability of a commodity, and ease of dissemination. Inventory, continual rotation, and quarterly quality inspections guarantee quality control. A request generates shipping of a pre-configured push package via ground or air to state and local authorities. A technical advisory response unit can also be deployed with the SNS assets for advice and assistance. The SNS was used successfully in New York City following the September 11 attacks and again in response to the anthrax attacks of 2001.

The SNS program staffs, trains, and educates providers, responders, and others in disaster preparedness. In addition, the program continually works with other agencies, including regional coordinators, the Department of Veterans Affairs, the DoD, and FEMA to improve and coordinate efforts. Improvements are ongoing within the program. These developments include expanding the capability to respond to new and emerging threats, working with state and local authorities on preparedness plans, and addressing operational issues when responding to terrorist threats. The SNS is currently striving to increase city readiness; its goal is to be able to provide oral medications to 100% of the population of selected cities within 48 hours of an event.

### Laboratory Response Network

Another national resource for both information and collaboration is the Laboratory Response Network. This network coordinates multiagency laboratories into an integrated communication and response plan.

The network first became operational in 1999 in accordance with *Presidential Decision Directive 39* under the DHHS and CDC.<sup>1</sup> The network brings together experts from various agencies to coordinate sample testing and to increase laboratory capability. Agencies participating in this program include the CDC, the DHS, the US Environmental Protection Agency, the US Department of Agriculture, the US Food and Drug Administration, the DoD, the DHHS, and other federal agencies, as well as international, state, and local public health laboratories. There are currently over 100 laboratories participating in the network.<sup>33</sup>

Laboratories are categorized according to their ca-

pabilities and responses into sentinel, reference, and national laboratories. Sentinel laboratories process samples for routine diagnostic purposes and determine if the samples should be shipped to reference and national laboratories. Reference laboratories (there are approximately 140) are federal, military, and international laboratories that specialize in veterinary, agricultural, food, water, or soil testing. National laboratories (eg, the CDC or military labs) perform definitive testing when required.<sup>33</sup> Some examples of these tests include cholinesterase testing done at USACHPPM, thiodiglycol testing at USAMRICD, and several biological tests performed at the CDC and USAMRIID.

### CHEMICAL PREPAREDNESS PROGRAMS AND INITIATIVES

In 1985 Congress mandated destroying all the US chemical agent and munitions stockpiles. The original date of completion for this project was 1994; however, the date was extended to 2007 after the US Senate ratified the destruction of chemical weapons during the Chemical Weapons Convention in April 1997. Congress also directed that the well being and safety of the environment and the general public be protected in and around the areas of the eight chemical weapons storage sites. This direction led to the Chemical Stockpile Emergency Preparedness Program (CSEPP), established in 1988 and revised in 1995.<sup>34</sup>

A memorandum of understanding (MOU), issued in March 2004, directs the Department of the Army and DHS (through FEMA) to identify their respective roles and efforts in emergency response preparedness in the areas surrounding the remaining seven stockpile sites of chemical munitions.<sup>35,36</sup> The Army is the custodian for these stockpiles and FEMA provides guidance, funding, resources, and training. Other agencies lend support as needed through expert consultants. These agencies include the US Environmental Protection Agency and the DHHS. Currently the Army stockpile sites are:

- Anniston Chemical Activity (Anniston, Alabama)
- Blue Grass Chemical Activity (Richmond, Kentucky)
- Newport Chemical Depot (Newport, Indiana)
- Pine Bluff Chemical Activity (Pine Bluff Arsenal, Arkansas)
- Pueblo Chemical Depot (Pueblo, Colorado)
- Tooele Chemical Activity (Tooele Army Depot, Utah)
- Umatilla Chemical Depot (Hermiston, Oregon)

The risk to the local communities in and around the seven chemical storage sites in the United States remains. The greatest risk is a natural or human-made event that causes the release of chemical agents from these storage facilities. There is a direct link between destroying the stockpiles under the chemical demilitarization program (see Chapter 4, History of the Chemical Threat, Chemical Terrorism, and Its Implications for Military Medicine) and the emergency preparedness plan. Officials in states and counties where these demilitarization sites are located must have emergency preparedness initiatives in place before destruction operations begin. Budgeting and funding for CSEPP are primarily approved through the Army after funding requirements are outlined by the states and counties. The Army, FEMA, and state and local communities need a constant, proactive approach to disaster preparedness. Several areas of continuous improvement are crucial to the success of the demilitarization program, such as applying lessons learned, having better relations with state and local communities, and providing assistance and guidance to states on technical assistance and leadership.<sup>36</sup>

These chemical depot communities exercise preparedness and assess the effectiveness and capabilities of federal, state, and local response organizations. CSEPP exercises consist of two types: federally managed exercises and alternative year exercises. Federally managed exercises, led by Army and FEMA codirectors, involve mobilization of emergency facilities, command posts, and communications centers and are federally mandated evaluations of a community's capability to respond to a chemical accident or incident. The alternative year exercise is used by the community to assess its training needs, review standard operating procedures, and evaluate resources, equipment, and personnel. Other exercises include tabletop reme-

diation and recovery exercises and Army-mandated, quarterly chemical accident or incident response and assistance exercises.<sup>37</sup> All exercises are evaluated and analyzed to assess performance. The evaluations compare performance based on criteria from Army Regulation 50-6<sup>37,38</sup> and the applicable portions of the Code of Federal Regulations.

Emergency procedures are in place in the communities surrounding chemical stockpiles and the procedures are published. Through the CSEPP program, the communities work with FEMA and the Army to enhance their preparedness and will continue to do so until the stockpiles no longer exist. CSEPP's successes have been nationally recognized. The community risk has been significantly reduced in Aberdeen, Anniston, and Tooele, demonstrating to other communities that applying the lessons learned is beneficial.<sup>39</sup> Some lessons learned that have contributed to decreased risk

include advances in building and improving public warning systems, increasing public awareness, and adding more trained medical personnel and responders.

Another valuable chemical countermeasure resource is the Chemical Security Analysis Center. The center provides threat awareness and assessment on a variety of chemical-related threats (eg, chemical warfare agents, toxic industrial chemicals) through a forum for subject matter experts. It supports information management, reach-back capability, and threat characterization. A similar project was developed in 2004 for the center's biological counterpart, the National Bio-Defense Analysis and Countermeasure Center. Currently the Chemical Security Analysis Center is planned for a central location and is to provide easy access to the database. These efforts aim to prevent and mitigate the consequences of chemical or biological threats by preparing ahead.

## TRAINING AND EDUCATION

Training and education are an integral part of any community response to an emergency, including an act of terrorism. The ability to respond safely and effectively to incidents of chemical, biological, or radiological terrorism resulting in large numbers of casualties requires disaster education and preparedness training. This unique training, required for military response teams and healthcare providers (particularly those involved in CBRNE), has been a valuable asset in domestic preparedness. Increasing awareness and training in CBRNE will continue to be important. By building on knowledge, increasing awareness, training in CBRNE, and applying lessons learned, military and civilian medical providers and first responders will become more proactive in preventing and deterring attacks and minimizing the effects of a human-made or natural disaster. In 2001 the Joint Commission on Accreditation of Healthcare Organizations challenged healthcare providers to obtain the proper training and education to decrease vulnerabilities of a catastrophic incident and improve communications between agencies for a more efficient and rapid response through emergency planning and training exercises.<sup>40</sup>

CBRNE training for the DoD is multiservice and single-service oriented. Although each service may have its own defense CBRNE doctrine, all US military services support the joint doctrine. The goals of these efforts are to ensure publications are up to date, coordinated across services, and relevant. For example several of the Army's field manuals<sup>41,42</sup> are part of multiservice doctrines. These Army manuals have Air Force, Navy, and Marine counterpart manu-

als that are service-specific, but that all support joint publications that are currently available or under development.<sup>23,42,43</sup>

Across the services, initial entry training for CBRNE events on the battlefield begins with first aid, self aid, and buddy aid. This training is augmented with rigorous instruction on employing the various mission-oriented protective posture levels and conducting personnel and equipment decontamination. Equipping service members with mission-oriented protective posture gear, pyridostigmine bromide pretreatment tablets, atropine and 2-pralidoxime chloride autoinjectors, diazepam, decontamination kits, chemical agent detection paper, and training on the use of these supplies is the foundation from which to build. Operationally, US Army Medical Department, US Army Chemical Corps, and US Army Ordnance Corps personnel with specialized training in CBRNE are a valued training resource. Effective training is essential for handling mass casualty situations, treating field casualties expediently, and managing unique aspects related to treating CBRNE casualties. The challenge of decreasing vulnerabilities and improving preparedness becomes one of improving communication between agencies for a more efficient and rapid response so that the right materials and individuals are present at the right time and place.

There have been many changes in disaster preparedness since the attacks on the World Trade Center and the Pentagon in 2001. Above all, the military healthcare system has improved medical readiness. The position of assistant secretary of defense for acquisition,

technology, and logistics was established by DoD Directive 2000.12 on August 18, 2003, to direct CBRNE readiness for military medical education and training. Military education and training ensures that medical services and personnel can perform optimally in all types of disaster environments. The Office of The Surgeon General oversees and integrates the medical aspects of CBRNE programs, including materiel development, testing, evaluation, and medical oversight of nonmedical programs for all Army medical personnel. However, whoever commands and oversees these programs today could change tomorrow, so military medical personnel need to be ready for the next catastrophic event.

In their domestic preparedness roles, today's DoD healthcare providers must be capable of managing military casualties and may also be required to work with civilian healthcare agencies and providers as well as other civilian first responders and support personnel. Training for catastrophic chemical incidents has become a joint effort as well as an exchange of knowledge and emergency medical training. The US Army Medical Department has addressed the training and education of healthcare providers in the medical management of CBRNE illness or injuries in Army Regulation 40-68.<sup>43</sup> This regulation states that for clinical privileges or staff appointment approval, providers must be educated in the medical diagnoses and appropriate management of CBRNE casualties. In 2003 the Force Health Protection Council endorsed standards of proficiency training as a requirement for all medical personnel throughout the DoD.<sup>44</sup>

The Defense Medical Readiness Training Institute in San Antonio, Texas, was tasked to conduct a CBRNE training gap analysis by the assistant secretary of health affairs in 2004. In 2002 the joint staff and the deputy assistant secretary of affairs for force health protection and readiness tasked the defense medical readiness training institute to develop a tri-service CBRNE training program. This is a distance learning training program for all DoD employees. The program was developed with core competencies for clinical, medical, and specialty areas for all DoD medical employees. The program consists of a basic course, an operators' and responders' course, a clinical course, and an executive and commander course. Course levels include initial, sustainment, and advanced.<sup>45</sup>

Training for CBRNE and medical force health protection is conducted at the Army Medical Department Center and School, USAMRICD, USAMRIID, the Armed Forces Radiobiology Research Institute, and USACHPPM. The Web sites of the DHS, FEMA, the Navy, the Air Force, and the Army also offer training courses. The Uniformed Services University of the

Health Sciences conducts a chemical warfare and consequence management course that brings together leading chemical warfare authorities from the DoD and federal, state, and local governments. The course addresses some potentially controversial topics that may be faced when making policy decisions.

In 2001 the US General Accounting Office stated in its report to the chairman of the Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform, House of Representatives, that the "gold standard" programs for medical training and education were the Medical Management of Chemical and Biological Casualties Course, the Field Management of Chemical and Biological Casualties Course,<sup>46</sup> and the Hospital Management of CBRNE Incidents Course developed soon after.<sup>23</sup>

The Medical Management of Chemical and Biological Casualties Course is conducted by USAMRICD and USAMRIID. The course is designed for US Army Medical Corps, Nurse Corps, and Medical Service Corps officers, physician assistants, and other selected medical professionals. Classroom instruction and laboratory and field exercises prepare students to effectively manage the casualties of chemical and biological agent exposure. Classroom discussion includes the history and current threat of chemical and biological agent use, the characteristics of threat agents, the pathophysiology and treatment of agent exposure, and the principles of field management of threat agent casualties. In the field, attendees practice the principles of personal protection, triage, treatment, and decontamination of chemical casualties. During this exercise, attendees learn the capabilities and limitations of mission-oriented protective posture when treating casualties in a simulated contaminated environment. Continuing medical education credits are available for this training.<sup>23</sup>

The Field Management of Chemical and Biological Casualties Course is conducted by USAMRICD at Aberdeen Proving Ground, Maryland. The course is designed for Medical Service Corps officers, Chemical Corps officers, and noncommissioned officers in medical or chemical specialties. Classroom instruction and laboratory and field exercises prepare students to become trainers in the first echelon management of chemical and biological agent casualties. There are small-group computer and briefing exercises that reinforce casualty management principles. During the 2 days of field training, attendees establish a casualty decontamination site and use the site during scenario-based exercises to manage litter and ambulatory casualties. Attendees practice the principles of personal protection, agent detection, triage, emergency

treatment, and decontamination of chemical casualties at the site.<sup>23</sup>

The Hospital Management of CBRNE Incidents Course is conducted jointly by USAMRICD, USAMRIID, and the Armed Forces Radiobiology Research Institute. The course is designed for hospital-based medical professionals, including healthcare professionals, hospital administrators, medical planners, and others who plan, conduct, or are responsible for hospital management of mass-casualty incidents or terrorism preparedness. The course consists of classroom instruction, scenarios, and tabletop exercises with military and civilian hospital-based medical and management professionals with skills, knowledge, and information resources to carry out the full spectrum of healthcare facility responsibilities required by a CBRNE event.

Nonmedical NBC and CBRNE courses offered to the military include leadership courses in homeland security, antiterrorism and force protection, and consequence management, in addition to the ongoing developmental courses available to both enlisted service members and officers (eg, officer and noncommissioned officer basic and advanced courses). Opportunities also exist for certain individuals in CBRNE defense specialist training from the US Army Chemical School and the Defense Threat Reduction Agency Defense Nuclear Weapons School. Other professional military, nonmedical education includes the US Army CBRN Defense Professional Training at Fort Leonard Wood, Missouri.<sup>23</sup>

In addition to specialized, credentialed medical training, there are other opportunities for civilian and military individuals to obtain further education in general homeland security training. After September 11, 2001, courses on homeland security, preparedness, consequence management, and response were offered at colleges and universities across the nation. Courses range from introductory levels and information awareness to full-credit courses. These courses introduce students to topics including policy, legislation, security, management, operations, and planning.

Online distance learning and educational information are also easily accessible. The Web sites of the DHS, the CDC, and the DHHS have several valuable links that can be used to find resources for planning preparedness operations, online courses for accreditation, and reference materials for responders and medical personnel. FEMA offers an online course covering the incident command system, starting with a basic course and advancing through the NIMS and the NRP. Students are entered into a national database as trained individuals upon graduation.<sup>47</sup> In addition, the DHS and other federal agencies offer several assistance programs, grants and training courses to states and

localities on terrorism preparedness and healthcare emergency services.<sup>48-50</sup>

Finally, there are several informational resources worth noting. The CDC, for example, has numerous references on topics related to chemicals and chemical emergencies. Its emergency preparedness and response Web site has a wide variety of information for both healthcare professionals and the general public.<sup>50</sup> Another valuable source of information from the DHHS is the Agency for Toxic Substances and Disease Registry.<sup>19</sup> This is a health registry of the DHHS and CDC that is available to the public and provides valuable information on toxic profiles of potentially hazardous substances and their health effects, if known. The substances are ranked according to their potential risk for exposure. The information is easy to read and understand and is updated by peer review. Currently there are 289 toxicological profiles that can be used by emergency responders.<sup>19</sup>

The Agency for Toxic Substances and Disease Registry is capable of assisting local, state, and federal agencies in responding to chemical terrorist acts by analyzing biological and environmental samples. The registry offers an emergency hotline service, maintains a Web site, and provides training, exercises, and qualification certification to improve laboratories.<sup>19,50</sup>

## Exercises

Exercises are the best test of the effectiveness of preparedness plans, policies, and training. These practices measure agency and interagency abilities to respond to incidents and are critical tools that can be used to enhance coordination. Exercises also provide a way to initiate policy change, review lessons learned, and give quantifiable performance measurements that can be used for certification purposes and improvement. Exercises can be conducted at many levels, from local to national.

The first step in conducting an exercise is to train the trainers, and that process usually begins with tabletop exercises that are conducted with representatives from participating agencies. Local, state, and federal systems are tested addressing local and state response and how well that response integrates with federal support. The final step in practical exercise is usually a full-scale exercise, such as a mock event, that includes first responders, private individuals, businesses, and local, state, and federal agencies. The goal of training should be to provide immediate feedback to participants, reinforce training, and evaluate a particular method's effectiveness. An additional goal is to learn from the exercise to improve the preparedness plan for the next exercise or real

event. Exercises should test the system to evaluate alternative solutions, approaches, and personnel as well as equipment needs.

The DHS Office for Domestic Preparedness has developed government-based emergency preparedness exercises involving multiple agencies. These top-official, national-level, terrorism exercises involve a specific event and are geared toward senior-level offi-

cial at all levels of government. The exercises evaluate emergency preparedness, response, and consequence management. They were congressionally mandated in May 2000 and they continue to strengthen the nation's capabilities in responding to, preparing for, and recovering from a full-scale terrorist attack. The fourth (and largest) top-official exercise took place October 15 to 19, 2007.

## SUMMARY

The 2006 *Quadrennial Defense Review Report* outlines the vision for forces of the DoD to "be organized, trained, equipped, and resourced to deal with all aspects of the threat posed by weapons of mass destruction."<sup>14</sup> In order to accomplish this goal, military healthcare providers must be able to anticipate and respond to certain threats. Today's military healthcare providers must be capable of managing casualties within a broad, multiagency framework that adapts according to the scope and specifics of an incident. In addition to the traditional patient-provider role, military healthcare providers, logisticians, and leaders must be trained and equipped to assume a variety of other roles, from advising to involvement in specific response teams. Beyond understanding the nature of the hazards and medical management of

casualties, today's military healthcare provider must understand national policies, the overall structure of a disaster response, and the DoD's role in support of civilian authorities during the consequence management phase of recovery from an incident. This can be accomplished with the knowledge acquired through research, technology development, awareness of the role of military healthcare providers within DoD and the military healthcare system, and training, including joint exercises with other agencies. Through continued learning, practice, and shared lessons learned, military healthcare providers expand their ability to respond effectively and efficiently in the event of an incident. Should one occur, a well-trained, fully prepared military medical community can alter the outcome of a major CBRNE event.

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## REFERENCES

1. US Office of the Press Secretary, White House. *US Policy on Counterterrorism*. Washington, DC: The White House; 1995. Presidential Decision Directive 39. Unclassified.
2. US Office of the Press Secretary, White House. *Combating Terrorism*. Washington, DC: The White House; 1998. Presidential Decision Directive 62. Unclassified.
3. National Defense Authorization Act for Fiscal Year 1997. Pub L 104-201. 23 September 1996.
4. US Department of Defense. *Domestic Preparedness Program in the Defense against Weapons of Mass Destruction*. Washington, DC: DoD; 1997. Report to Congress.
5. Moore DH, Alexander SM. Emergency response to a chemical warfare agent incident: domestic preparedness, first response, and public health considerations. In: Somani S, Romano J, eds. *Chemical Warfare Agents: Toxicity at Low Levels*. Boca Raton, Fla: CRC Press; 2001: 409-435.
6. Institute of Medicine and National Research Council. Introduction. In: *Chemical and Biological Terrorism, Research and Development to Improve Civilian Medical Response*. Washington, DC: National Academy Press; 1999: 15-28.

7. US Office of Homeland Security. *National Strategy for Homeland Security*. Washington, DC: OHS; 2002.
8. US Office of Homeland Security. *Organization and Operation of the Homeland Security Council*. Washington, DC: Office of the Press Secretary; 2001. Homeland Security Presidential Directive 1.
9. US Office of Homeland Security. *Homeland Security Advisory System*. Washington, DC: Office of the Press Secretary; 2002. Homeland Security Presidential Directive 3.
10. US Office of Homeland Security. *Management of Domestic Incidents*. Washington, DC: Office of the Press Secretary; 2003. Homeland Security Presidential Directive 5.
11. US Department of Homeland Security. *National Incident Management System*. Washington, DC: DHS; 2003.
12. US Department of Homeland Security. *National Response Plan*. Washington, DC: DHS; 2004.
13. US Office of Homeland Security. *National Preparedness*. Washington, DC: Office of the Press Secretary; 2003. Homeland Security Presidential Directive 8.
14. US Department of Defense. *Quadrennial Defense Review Report*. Washington, DC: DoD; 2006.
15. US Department of Defense. *Strategy for Homeland Defense and Civil Support*. Washington, DC: DoD; 2005.
16. US Department of Defense. *The National Defense Strategy of the United States of America*. Washington, DC: DoD; 2005.
17. The White House. *National Security Strategy of the United States of America*. Washington, DC: Office of the Press Secretary; 2002.
18. Bea K. *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding*. Washington, DC: Congressional Research Service; 2005. CRS report for Congress, Order Code RL33053.
19. US Department of Health and Human Services. Agency for Toxic Substances and Disease Registry Web site. Available at: <http://www.atsdr.cdc.gov/>. Accessed 2006.
20. Smart JK. History of chemical and biological warfare: an American perspective. In: Zajtchuk R, ed. *Medical Aspects of Chemical and Biological Warfare*. Washington, DC: Department of the Army, Office of The Surgeon General, Borden Institute; 1997: 9–86.
21. US Department of the Army. *Medical Emergency Management Planning*. Washington, DC: DA; 2003. MEDCOM Pam 525-1.
22. Bea K. *Organization and Mission of the Emergency Preparedness and Response Directorate: Issues and Options for the 109th Congress*. Washington, DC: Congressional Research Service; 2005. CRS Report for Congress, Order Code RL33064.
23. US Office of the Deputy Assistant Secretary of Defense for Chemical and Biological Defense. *Department of Defense Chemical, Biological, Radiological and Nuclear Defense Program*. Washington, DC: DoD; 2005. Annual report to Congress.
24. Global Security Military Web site. Available at: [www.globalsecurity.org/military/agency/usmc](http://www.globalsecurity.org/military/agency/usmc). Accessed November 2006.
25. Christmas W, Todd M. Chemical corps efforts to support the National Guard in its role as responders for CBRNE missions. *Army Chemical Review*. 2005:7–12.
26. US Department of the Army. *Mission Training Plan for the Area Medical Laboratory*. Washington, DC: DA; Dec 2002. ARTEP 8-668 (MRI)-30-MTP.
27. US Department of the Army. *Health Service Support in Corps and Echelon above Corps*. Washington, DC: DA; 2004. Field Manual 4.02-12.

28. Taylor PW, Gordon SW, Hall TL, Kimm GL, Tyner SP, VanHorn GT. Force health protection through laboratory analysis and health risk assessment. *US Army Medical Department Journal*. 2006:66–72.
29. Taylor P, Lukey B, Clark C, Lee R, Roussel R. Field verification of Test-Mate ChE. *Mil Med*. 2003;168:314–319.
30. Shippee RL. The TAML/AML concept: lessons/learned prescription for change. *US Army Medical Department Journal*. 2004;July–Sep:65–68.
31. Slife H, Winston J. Telechemistry, projecting laboratory expertise to a deployed area medical laboratory. *Mil Med Tech*. 2005;9.3:39–42.
32. US Department of the Army. *MEDCOM Emergency Management*. Washington, DC: DA; 2000. US Army Medical Command Regulation 525-4.
33. US Department of Health and Human Services, Centers for Disease Control and Prevention. *The Public Health Response to Biological and Chemical Terrorism: Interim Planning Guidance for State Public Health Officials*. Washington, DC: DHHS; 2001.
34. US Department of Health and Human Services, Centers for Disease Control and Prevention. CDC recommendations for civilian communities near chemical weapons depots: guidelines for medical preparedness. *60 Federal Register* 123 (June 27, 1995): 3308–3312.
35. US Department of the Army, Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology) and Department of Homeland Security Emergency Preparedness and Response Directorate. *Exercise Policy and Guidance for the Chemical Stockpile Emergency Preparedness Program*. Washington, DC: DA; 2004.
36. US General Accounting Office. *Chemical Weapons: FEMA and Army must be Proactive in Preparing States for Emergencies*. Washington, DC: GAO; 2001. Report to Congress GAO-01-850.
37. US Department of the Army. *Chemical Accident or Incident Response and Assistance (CAIRA) Operations*. Washington, DC: DA; 2003. DA PAM 50-6.
38. US Department of the Army. *Chemical Surety*. Washington, DC: DA; 2001. Army Regulation 50-6.
39. US Department of the Army, US Department of Homeland Security, US Federal Emergency Management Agency. *CSEPP Update*. Washington, DC: DA, DHS, FEMA; 2004. Publication no. III.
40. Rubin J. Recurring pitfalls in hospital preparedness and response. *Journal of Homeland Security*. 2004.
41. US Department of the Army. *Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Contamination Avoidance*. Washington, DC: DA; 2006. Army Field Manual 3-11.3.
42. US Department of the Army. *Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Aspects of Consequence Management*. Washington, DC: DA; 1978. Army Field Manual 3-11.21.
43. US Department of the Army. *Medical Services, Clinical Quality Management*. Washington, DC: DA; 2004. Army Regulation 40-68.
44. Winkenwerder W, Assistant Secretary of Defense for Health Affairs. *Chemical, Biological, Radiological, Nuclear, and (High Yield) Explosives Training for Military Medical Personnel*. Washington, DC: DoD; 2004.
45. Pueschel M. Core DoD response skills targeted. *US Medicine Information Central*. 2003;54:article 730.
46. US General Accounting Office. *Chemical and Biological Defense: DoD Needs to Clarify Expectations for Medical NBC Readiness*. Washington, DC: GAO; 2001. Report to the Chairman, Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform, House of Representatives GAO-02-38.

47. Federal Emergency Management Agency Independent Study Program Web site. Available at: <http://training.fema.gov/IS/>. Accessed November 2006.
48. US Federal Emergency Management Agency. US Fire Administration Training Courses and Schedules Web site. Available at: [www.usfa.dhs.gov/applications/nfacsd](http://www.usfa.dhs.gov/applications/nfacsd). Accessed November 28, 2006.
49. US Department of Health and Human Services, Centers for Disease Control and Prevention. Emergency Preparedness and Response: Chemical Emergencies Web site. Available at: [www.bt.cdc.gov/chemical](http://www.bt.cdc.gov/chemical). Accessed November 2006.
50. US Department of Health and Human Services, Health Resources and Services Administration. Grants: Find, Apply, Review, Manage, Report Web site. Available at: [www.hrsa.gov/grants/](http://www.hrsa.gov/grants/). Accessed November 2006.

