

WORKING SESSION 1B: INFECTIOUS DISEASES

RESPONDING TO BIOTERRORISM

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INTRODUCTION

Although the United States experienced its first modern episode of bioterrorism in 1984,¹ few physicians have viewed this threat with any serious concern, until recently. Following 9/11 and the subsequent multi-state outbreak of anthrax, interest in bioterrorism preparedness has blossomed. To respond effectively to bioterrorism, the medical community needs to work closely with public health and other response agencies. Physicians will diagnose the first cases that herald a bioterrorist attack. This paper provides an overview of public health preparedness for bioterrorism and highlights the critical role that physicians play in the emergency response system.

HOW BIOTERRORIST EVENTS DIFFER FROM OTHER DISASTERS

Bioterrorism is the intentional use of a pathogen or biological product to cause harm to humans and other living organisms, to influence the conduct of government, or to intimidate or coerce a civilian population.² An act of bioterrorism may create a disaster and produce a state of emergency. Bioterrorism, however, is fundamentally different from other forms of natural disasters—such as floods, tornadoes, and hurricanes. In natural disasters, although the consequences can be devastating, with considerable loss of life and property and attendant civil disturbance, these “acts of God” lack the intentional generation of fear or panic caused by a criminal act. Bioterrorism is a form of “asymmetric” warfare, whereby a rela-

tively “small” event (such as the 21 cases of anthrax nationwide in 2001) can produce widespread changes in a population’s beliefs, behaviors, and practices.

Several key features differentiate an attack of bioterrorism from other disasters. There may be delayed recognition of an attack. With a coordinated release, we may be facing multiple simultaneous events. For some infectious agents that cause communicable disease, those who respond—from EMS personnel to hospital staff—may be at higher risk of contracting disease. The scope of the event may increase rapidly and the public reaction may be strong and less predictable.

The covert or unannounced release of an agent may be difficult to recognize at first. Typically, persons will begin to visit ambulatory clinics and emergency departments following onset of symptoms. Because many of the illnesses caused by biological agents have a non-specific prodrome (eg, fever, malaise, and other non-specific symptoms), they are difficult to distinguish from other common ailments, such as acute respiratory or influenza-like illnesses. Definitive laboratory diagnostic tests are typically not available or not obtained. Although a rapid increase in the number of patients with similar complaints may alert an astute clinician that something is awry, even recognition of a common-source exposure (eg, the release of an agent into a building’s air circulation system) may be delayed if the patients seek care from multiple healthcare facilities, with no single provider experiencing the increase in the number of ill persons.

In addition to an increase in the number of ill patients, other clues that

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may signal a covert bioterrorist attack include an increase in unexplained deaths, an unusual age distribution of the patients (eg, severe illness among persons 20–50 years old), unusual seasonality (eg, severe widespread respiratory illness during the summer months), an unusual manifestation of disease (eg, inhalational anthrax), or the occurrence of an animal die-off (eg, the death of crows heralding the arrival of West Nile virus in New York City in 1999).

ORGANIZATION OF EMERGENCY MANAGEMENT AND RESPONSE

In Georgia, as in most states, the local political jurisdiction has responsibility for emergency management and response, and each county has an emergency management agency. The city of Atlanta, as well as many other major US cities, hosts a Metropolitan Medical Response System (MMRS).³ Originally organized for the 1996 Olympics, the Atlanta MMRS has received federal support for specially trained responders and equipment.

When the disaster response outstrips local resources or involves multiple jurisdictions, the local emergency manager seeks assistance and coordination at the state level. When state capacity is exceeded, the Governor may—through the state Georgia Emergency Management Agency (GEMA)—seek federal assistance, which is usually coordinated by

the Federal Emergency Management Agency (FEMA).

Public health operates similarly. Local boards of health (or health departments) may seek assistance from the state health department, which may seek assistance from the Centers for Disease Control and Prevention (CDC). When medical services are overwhelmed, the federal government may mobilize the National Disaster Medical System.³ The NDMS comprises 7,500 volunteer health professionals organized into general and specialty teams.

SPECIAL POWERS UNDER A PUBLIC HEALTH EMERGENCY

With a bioterrorist attack, these basic local-state-federal relationships hold, with an additional stipulation. Presidential Decision Directives stipulate that during a terrorist attack, the Federal Bureau of Investigation has the lead federal role for crisis management, and FEMA has lead responsibility for consequence management.⁴ Similarly, in Georgia for example, the Georgia Bureau of Investigation (GBI) has the lead state role for crisis management, and GEMA for consequence management. If a bioterrorist attack triggers a presidential declaration of a national emergency, the Department of Health and Human Services (DHHS), under the auspices of the Federal Response Plan, assumes the primary federal role for health. Thus, a federal law enforcement agency assumes lead responsibility for conducting the criminal investigation generated by a terrorist threat, and federal health assets are available to supplement local resources.

Protection of the public's health, however, is a power reserved, under the US Constitution, to the states as an exercise of their police powers. Thus, in the event of a bioterrorist event, the local jurisdiction (eg, county executive officer, mayor, or other chief elected official)—in concert with the local health

authority—may declare a public health emergency. Under these circumstances, the local health authority may exercise those powers vested under such a declaration. Similarly, a Governor may declare a state of public health emergency, thereby invoking, within the limitations of state statute, broad exercise of power to address the situation. A concomitant presidential declaration of emergency, as noted above, would enable release and distribution of federal assets in support of the governor's declaration, but would not usurp any emergency public health powers reserved to the state.

CURRENT HOSPITAL EFFORTS

Hospitals play a key role in bioterrorism response; they face several daunting challenges. The American Hospital Association recently published their staffing recommendations for hospital preparedness, which include: a) accurate counts of capacity; b) identified "reserve staff"; c) use of temporary privileges; and d) support of staff families. Hospital staff and administrators have consistently identified care (eg, child care) for family members of staff as the highest priority and most likely barrier to an effective hospital response.⁵

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) recently modified their standards in 4 ways.⁶ Healthcare organizations are expected to address the four phases of disaster planning (mitigation, preparedness, response, and recovery). Hospitals are expected to take an "all hazards approach" to planning that includes a hazard vulnerability analysis. Individual hospitals, to be effective, are expected to take their lead in this arena from responsible federal, state, and local government authorities. Finally, there is a new requirement that the healthcare organization participate in at least one annual community-wide practice drill

involving credible community threats, including those posed by bioterrorism.

State hospital associations can assume an important coordinating role. The Georgia Hospital Association (GHA), for example, has formed an Emergency Preparedness Task Force to identify gaps in readiness to provide services during emergencies and to create strategies to fill those gaps.⁷ The GHA has sponsored educational programs via TELNET and each week provides updated information to member hospitals through their *DisasterReadinessline*.

Several of the Category A agents are transmissible from person-to-person (eg, smallpox, plague, and the viral hemorrhagic fevers). To prevent nosocomial transmission, hospitals will need to adhere closely to infection control guidelines. The Association for Professionals in Infection Control and Epidemiology (APIC) has produced a Bioterrorism Readiness Plan: A Template for Healthcare Facilities to guide implementation of infection control practices.⁸

RAPIDLY EVOLVING SMALLPOX VACCINATION PROGRAM

The smallpox vaccination program has evolved rapidly during the last 2 years, with significant changes in its scope, direction, and implementation. In many ways, this preparedness program has fostered new and stronger relationships among hospitals, the private medical community, and public health authorities.

In June 2001, CDC published revised vaccinia (smallpox) vaccine recommendations of the Advisory Committee on Immunization Practices (ACIP).⁹ At the time, the ACIP felt that "the risk for smallpox occurring as a result of a deliberate release by terrorists is considered low" and therefore preexposure vaccination was not recommended for public health workers or medical personnel. During the next 18 months,

this recommendation changed substantially, as state and local health departments assumed new roles and responsibilities. With this report, the ACIP reaffirmed use of a ring vaccination strategy to control an intentional release of smallpox. Ring vaccination involves actively identifying cases of smallpox and vaccinating those in close contact, creating ever-widening circles of persons who are immune from illness and therefore natural barriers to disease transmission.

In September 2001, CDC published its first (since declaration of worldwide eradication of variola in 1980) Smallpox Response Plan and Guidelines, in response to the "threat of the potential use of variola virus as a bioterrorist weapon." Beginning in November 2001, CDC convened several meetings of state and local health department personnel to present the guidelines. The guidelines, revised in January 2002, endorsed "surveillance and containment" or ring vaccination as the primary control strategy. At that time, there was believed to be a limited supply of vaccine available—about 15 million doses of Wyeth Dryvax vaccine left over from the smallpox eradication campaign.

With the terrorist attack and anthrax outbreak the previous autumn, CDC requested the ACIP in June 2002 to revisit its smallpox vaccination recommendations. Following the successful smallpox vaccine dilution trials,¹⁰ the discovery of additional vaccine stored at a pharmaceutical company, and the federal contract to obtain 209 million doses of smallpox vaccine produced in cell culture, vaccine supply was now perceived as more plentiful. The ACIP recommended pre-release voluntary vaccination of smallpox response teams and selected healthcare workers at designated hospital facilities "aka 'Type C' smallpox isolation care facilities."¹¹

In September, CDC issued a guidance to plan for mass post-event vaccination of the entire US population within a 10-day period. The CDC re-

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quested that states submit by December 1, 2002 their plans for vaccinating all of their residents under the auspices of this guidance.

In October, the ACIP issued revised guidelines that expanded the types of healthcare facilities that were eligible to participate in the voluntary pre-event smallpox vaccination program. Because hospitals balked at becoming designated (Type C) smallpox isolation care facilities, the ACIP felt "it was preferable to offer all acute care hospitals the opportunity to establish Smallpox Healthcare Teams."¹²

On November 22, 2002, CDC requested that each state health department submit plans for pre-event voluntary vaccination of smallpox response teams and healthcare teams. These plans were due December 9th and most states complied. On December 13th, President Bush announced a national plan to prepare for a smallpox attack. Declaring that there is "no reason to believe that smallpox presents an imminent threat," the President outlined plans to begin immediately vaccinating members of the military. For civilians, the first phase of the national plan called for vaccinating upwards of 500,000 healthcare and

public health workers. In Phase II of the plan, an additional 10 million “first responders”—police officers, firefighters, EMS personnel—will be vaccinated. On January 23, 2003 CDC shipped the first vials of vaccine. On January 28th, Connecticut began vaccinating volunteers against smallpox.

ROLE OF THE PRIMARY CARE PHYSICIAN

The primary care physician has a key role in bioterrorism preparedness and response. To enhance local preparedness, the physician needs to focus on 4 areas. First, become familiar with the diseases—their clinical manifestations, methods of diagnosis, and modes of treatment. Educational material abounds in peer-reviewed journals, through medical societies, and on the Internet.

Involve yourself in hospital preparedness activities. Although many government agencies and national organizations have published guidelines for planning, their adoption at the level of the specific hospital is uneven and incomplete. The guidelines provide direction, but plans need to be operationalized at each individual hospital.

Recognize that preparing for bioterrorism is an endeavor of community building, one that invites the full participation of physicians. To be effective, the community response plan will need to be coordinated across multiple institutions and public and private sectors. The ACIP recommends that all hospitals participate in the pre-event vaccination program, and CDC has requested the states to submit plans that fulfill this requirement. Become familiar with your state plan.

Other plans call for creation of neighborhood care centers to provide vaccinations or to relieve hospitals of the “worried well.” Who will staff these facilities? How will the community direct its medical resources to where they can

be most effective? How will we communicate effectively during a crisis? Answers to these questions need the input of practicing physicians.

Finally, appreciate that clinicians and public health agencies must continue to partner on bioterrorism preparedness and response.¹³ A Florida physician who examined a gram stain and called the health department detected the anthrax outbreak. Many of the emerging diseases of the past 4 decades—Legionnaire disease, toxic shock syndrome, HIV/AIDS, eosinophilia myalgia syndrome, Hanta virus infection, West Nile virus—were detected because an astute clinician noted something unusual and called the public health authorities. The reporting of unusual events—the sharing of information between the clinician and the health department—serves as a critical strategy in defending against bioterrorism and other emerging health threats. Your community deserves your support of a strong and ongoing relationship between public health and clinical medicine.

ADDITIONAL RESOURCES

Because bioterrorism preparedness is a new and rapidly evolving field, there is a continuing need for rapid dissemination of authoritative information. Internet-based distribution of information is available, with CDC’s Epi-X¹⁴ and various email notifications (eg, ProMed-mail,¹⁵ operated by the International Society for Infectious Diseases) as examples. The CDC also operates the Health Alert Network,¹⁶ an Internet-based system for distributing the most recent CDC guidelines.

A list of web sites with useful information is provided. Because we are dealing with circumstances that change rapidly, the user must anticipate that guidelines will undergo frequent—sometimes even daily—revision. With the widespread sharing of electronic alerts, we now face a new and unanticipated chal-

lenge—keeping track of the most recent updates. Primary care physicians are encouraged to develop habits to meet this challenge, such as frequently revisiting authoritative web sites and identifying new material. In this fashion, the primary care practitioner can keep current as we prepare for a future of shadowy threats and many unknowns.

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INTERNET INFORMATION RESOURCES

Bioterrorism and Disaster Preparedness Centers for Disease Control and Prevention
www.bt.cdc.gov

State Public Health Contact Telephone Numbers
<http://www.statepublichealth.org/director.php>

City and County Public Health Telephone Numbers
<http://www.naccho.org/general8.cfm>

Johns Hopkins Center for Civilian Biodefense
<http://www.hopkins-biodefense.org/>

Center for the Study of Bioterrorism and Emerging Infections, St. Louis University School of Public Health
<http://www.bioterrorism.slu.edu/>

Rapid Response Information System
<http://www.rris.fema.gov/>

US Army Medical Research Institute of Infectious Disease
<http://www.usamriid.arm.mil/education/index.html>

US Army Medical Research Institute of Chemical Defense
<http://chemdef.apgea.arm.mil/>

USAMRICD Chemical and Casualty Care Division
<http://ccc.apgea.army.mil/>

University of Alabama Center for Bioterrorism
<http://www.bioterrorism.uab.edu/>

University of South Florida Center for Biological Defense
<http://www.bt.usf.edu>

The AMA Disaster Preparedness and Medical Response Website
<http://www.ama-assn.org/go/DisasterPreparedness>

APIC Bioterrorism Readiness Plan: A Template for Healthcare Facilities
<http://www.apic.org/educ/readinow.html>

APIC Mass Casualty Disaster Plan Checklist: A Template for Healthcare Facilities
<http://www.apic.org/bioterror/checklist.doc>

WHO Health Aspects of Chemical and Biological Weapons
http://www.who.int/emc/deliberate_epi.html

AAFP-Biochemical Terrorism Defense: The Role of the Family Physician
<http://www.aafp.org/hssa/biochem>

Medical Management of Biological Casualties Handbook
<http://www.usamriid.army.mil/education/bluebook.html>

The Textbook of Military Medicine—Aspects of Chemical and Biological Warfare
http://ccc.apgea.army.mil/Documents/HTML_Restricted/index.htm
<http://chemdef.apgea.army.mil/textbook/contents.asp> (PDF files of each chapter)

Virtual Naval Hospital—Biological, Chemical, and Nuclear Warfare and Radiation Safety
<http://www.vnh.org/providers.html#nbc>

ACS—Unconventional Civilian Disasters: What the Surgeon Should Know
<http://www.facs.org/civiliandisasters/intro.html>

ACP-ASIM Bioterrorism Resources
<http://www.acponline.org/bioterro/>

[index.html](#)

Communicating with Children—American Academy of Pediatrics
<http://www.aap.org/advocacy/releases/disastercomm.htm>

Helping Children Cope with War and Terrorism (AMA)
<http://www.ama-assn.org/ama/pub/category/6174.html>

APA—Coping with Disaster (pdf file)
<http://www.psych.org/disaster/bioterrorism102201.pdf>

Disease Resources—CDC Category A Agents/Diseases
Biological and Chemical Weapons
<http://www.nlm.nih.gov/medlineplus/anthrax.html>

Smallpox
<http://www.nlm.nih.gov/medlineplus/smallpox.html>

Anthrax
<http://www.nlm.nih.gov/medlineplus/anthrax.html>

Tularemia as a Biological Weapon June 6, 2001
<http://jama.ama-assn.org/issues/v285n21/ffull/jst10001.html>

Botulinum Toxin as a Biological Weapon February 28, 2001
<http://jama.ama-assn.org/issues/v285n8/ffull/jst00017.html>

Plague as a Biological Weapon May 3, 2000
<http://jama.ama-assn.org/issues/v238n17/ffull/jst90013.html>

Anthrax as a Biological Weapon May 12, 1999
<http://jama.ama-assn.org/issues/v281n18/ffull/jst80027.html>

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<http://jama.ama-assn.org/issues/v281n22/ffull/jst90000.html>