Preparing for and Responding to Bioterrorism

Information for the Public Health Workforce

Tularemia and Viral Hemorrhagic Fevers

Developed by
Jennifer Brennan Braden, MD, MPH
Preparation for and Responding to Bioterrorism:
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Jennifer Brennan Braden, MD, MPH

Northwest Center for Public Health Practice
University of Washington
Seattle, Washington

*This manual and the accompanying MS Powerpoint® slides are current as of Dec 2002. Please refer to http://nwcphp.org/bttrain/ for updates to the material.*
Acknowledgements

This manual and the accompanying MS PowerPoint® slides were prepared for the purpose of educating the public health workforce in relevant aspects of bioterrorism preparedness and response. Instructors are encouraged to freely use portions or all of the material for its intended purpose.

Project Coordinator
Patrick O’Carroll, MD, MPH
Northwest Center for Public Health Practice, University of Washington, Seattle, WA
Centers for Disease Control and Prevention; Atlanta, GA

Lead Developer
Jennifer Brennan Braden, MD, MPH
Northwest Center for Public Health Practice, University of Washington, Seattle, WA

Design and Editing
Judith Yarrow
Health Policy Analysis Program, University of Washington, Seattle, WA

The following people provided technical assistance or review of the materials:
Jeffrey S. Duchin, MD: Communicable Disease Control, Epidemiology and Immunization Section, Public Health – Seattle & King County
Division of Allergy and Infectious Diseases, University of Washington, Seattle, WA
Jane Koehler, DVM, MPH: Communicable Disease Control, Epidemiology and Immunization Section, Public Health – Seattle & King County; Seattle, WA
Dennis Anderson, MA: Office of Risk and Emergency Management, Washington State Department of Health; Olympia, WA
Nancy Barros, MA: State of Alaska, Division of Public Health; Juneau, AK
Janice Boase, RN, MS, CIC: Communicable Disease Control, Epidemiology and Immunization Section, Public Health – Seattle & King County, Seattle, WA
Jeanne Conner, RN, BSN: Sweet Grass Community Health; Big Timber, MT
Marcia Goldoft, MD, MPH: Communicable Disease Epidemiology, Washington State Department of Health; Shoreline, WA
Nancy Goodloe: Kittitas County Health Department; Ellensburg, WA
Sandy Kuntz, RN: University of Montana School of Nursing; Missoula, MT
Mike McDowell, BSc, RM: Public Health Laboratories, Washington State Department of Health; Shoreline, WA
Patrick O’Carroll, MD, MPH: Centers for Disease Control and Prevention; Atlanta, GA
Maryann O’Garro: Grant County Health Department, Ephrata, WA
Carl Osaki, RS, MSPH: Department of Environmental Health, University of Washington; Seattle, WA
Sandy Paciotti, RN, BSN: Skagit County Health Department, Mount Vernon, WA
Eric Thompson: Public Health Laboratories, Washington State Department of Health; Shoreline, WA
Matias Valenzuela, Ph.D.: Public Health – Seattle & King County; Seattle, WA
Ed Walker, MD: Department of Psychiatry, University of Washington, Seattle, WA

Contact Information
Northwest Center for Public Health Practice
School of Public Health and Community Medicine
University of Washington
1107 NE 45th St., Suite 400
Seattle, WA 98105
Phone: (206) 685-2931, Fax: (206) 616-9415

Last Revised December 2002
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Preparing for and Responding to Bioterrorism: Information for the Public Health Workforce is intended to provide public health employees with a basic understanding of bioterrorism preparedness and response and how their work fits into the overall response. The course was designed by the Northwest Center for Public Health Practice in Seattle, Washington, and Public Health – Seattle & King County’s Communicable Disease, Epidemiology & Immunization section. The target audience for the course includes public health leaders and medical examiners, clinical, communicable disease, environmental health, public information, technical and support staff, and other public health professional staff. Health officers may also want to review the more detailed modules on diseases of bioterrorism in Preparing for and Responding to Bioterrorism: Information for Primary Care Clinicians: Northwest Center for Public Health Practice (available at http://nwcphp.org/btrain). Public health workers are a very heterogeneous group, and the level of detailed knowledge needed in the different aspects of bioterrorism preparedness and response will vary by job description and community. Therefore, the curriculum is divided into modules, described in Appendix A.
The course incorporates information from a variety of sources, including the Centers for Disease Control and Prevention, the United States Army Medical Research Institute in Infectious Disease (USAMRIID), the Working Group on Civilian Biodefense, the Federal Emergency Management Agency, Public Health – Seattle & King County, and the Washington State Department of Health, among others (a complete list of references is given at the end of the manual). The curriculum reflects the core competencies and capacities outlined in the following documents:

CDC. Bioterrorism preparedness and response: core capacity project 2001 (draft), August 2001.

CDC. Cooperative Agreement U90/CCUXXXXXX-03-X Public Health Preparedness and Response for Bioterrorism.
http://www.bt.cdc.gov/Planning/CoopAgreementAward/index.asp

www.bt.cdc.gov/Documents/Planning/PlanningGuidance.PDF

Center for Health Policy, Columbia University School of Nursing. Core public health worker competencies for emergency preparedness and response, April 2001: http://cpmcnet.columbia.edu/dept/nursing/institute-centers/chphsr/


The course is not copyrighted and may be used freely for the education of public health employees and other biological emergency response partners.

Course materials will be updated on an as-needed basis with new information (e.g., guidelines and consensus statements, research study results) as it becomes available. For the most current version of the curriculum, please refer to:
http://nwcphp.org/bttrain.
This manual provides the instructor with additional useful information related to the accompanying MS PowerPoint® slides. The manual and slides are divided into six topic areas: Introduction to Bioterrorism, Emergency Response Planning, Diseases of Bioterrorist Potential, Health Surveillance and Epidemiologic Investigation, Consequence Management, and Communications. Links to Web sites of interest are included in the lower right-hand corner of some slides and can be accessed by clicking the link while in the “Slide Show” view. Blocks of material in the manual are periodically summarized in the “Key Point” sections, to assist the instructor in deciding what material to include in a particular presentation. A Summary of Key Points is indicated in bold, at the beginning of each module.

The level of detailed knowledge required may vary for some topics by job duties. Therefore, less detailed custom shows are included in the Emergency Response Planning and Diseases of Bioterrorist Potential: Overview modules for those workers without planning oversight or health care responsibilities, respectively. In addition, there are three Consequence Management modules: for public health leaders, for public health professionals, and for other public health staff (see Appendix A).
Diseases of Bioterrorist Potential

Slide 1: Curriculum Title

Slide 2: Acknowledgements

Slide 3: Module Title
The learning objectives for this module are:

1. Describe the epidemiology, mode of transmission, and presenting symptoms of disease caused by the CDC-defined Category A agents
2. Identify the infection control and prophylactic measures to implement in the event of a suspected or confirmed Category A case or outbreak
Tularemia (Slides 5-19)

Summary of Key Points

1. In naturally occurring tularemia, infection virtually always occurs in a rural setting. Infection in an urban setting with no known risk factors or contact with infected animals suggests a possible deliberate source.
2. Tularemia is not transmitted person to person.
3. The most likely presentations of tularemia in a BT attack are pneumatic and typhoidal disease, as opposed to cutaneous disease in naturally occurring cases.
4. Tularemia can be treated and prevented with antibiotics.
Key Points, Slides 5-14

1. Tularemia is a vector-borne illness that occurs naturally in the United States following exposure to the bite of an infected arthropod or deer fly, direct exposure to contaminated animal tissues and fluids, or ingestion of contaminated food, water, or soil.

2. All forms of tularemia begin with a non-specific, febrile, flu-like illness.

3. Tularemia is usually a mild cutaneous disease, but pneumonic and typhoidal forms can be more severe.

Microbiology and Epidemiology (Slides 5-7)

Tularemia occurs naturally in the south-central and western states of the U.S. and northern and central Europe. In these areas, *F. tularensis* is found in a wide variety of animal hosts (particularly small mammals) and natural habitats including water, soil and vegetation. Infection is acquired through the bite of an infected tick, mosquito, or deer fly; through contact with infected animal tissues or secretions (e.g. field dressing small game); ingestion of contaminated food, water, or soil; and inhalation of infected aerosols. Hunters, trappers, farmers, and butchers are at increased risk for tularemia where the disease is endemic. Microbiology laboratory staff can be infected through exposure to culture plates via the aerosol route.
Epidemiologic clues are helpful in determining whether a case of tularemia has a deliberate source. Naturally occurring cases are typically infected in an outdoor or rural setting where the disease is endemic, usually in the summer. Cases occurring in winter are usually hunters exposed to infected animal carcasses. Infection in an urban setting (without known environmental exposure or other risk factor) and clusters of cases should immediately alert one to a potentially deliberate source.

*Francisella tularensis* has a low infectious dose, and is more easily obtainable than some of the other agents (e.g., variola major, *Y. pestis*). Tularemia is not transmitted person to person and, in its naturally occurring state, is rarely fatal. Pneumonic tularemia has a higher case fatality rate than other forms of tularemia, but is a less severe illness than that caused by either *Y. pestis* or *B. anthracis*. 
Case Definition and Classification (Slides 8-11)

Slides 8-11 outline the case definition and classification criteria for tularemia. The distinct forms of tularemia are identified based on the organ(s) in which clinical symptoms manifest. Clinical presentation and epidemiologic features may differ from typical in a biological attack, and the case definition may be revised as more information becomes known.

Laboratory confirmation of *F. tularensis* requires testing in an LRN laboratory, Level B or higher. Because of the risk of infection to laboratory staff and the need for special culture media, the laboratory must be alerted when tularemia is present or suspected.
Clinical Features of Tularemia (Slides 12-14)

The clinical features of ulceroglandular and pneumonic tularemia are summarized in slides 12-14. Besides pneumonic tularemia, pneumonia can also occur with other forms of tularemia, most commonly typhoidal. The clinical forms of tularemia depend on the route of exposure. Naturally occurring cases usually result from direct contact, and thus ulceroglandular tularemia is the most likely naturally occurring form of disease. As is the case with most of the critical agents, a BT attack with *F. tularensis* is most likely to occur via an aerosol release. Hence the most likely BT presentation is pneumonic tularemia. The next most likely BT presentation is typhoidal tularemia. Aerosol exposure to tularemia can produce profound constitutional symptoms in the absence of prominent respiratory signs, in addition to rapidly progressive pneumonia and septicemia in a smaller number of cases.
Pneumonic tularemia may be severe, but is not as rapidly progressive as pneumonic plague or anthrax. Radiographic (I.e., chest x-ray) signs are often minimal early in disease.
Treatment and Prophylaxis

There currently is no vaccine available for tularemia. Persons for whom the time of exposure to tularemia is known and who are in the incubation period should be treated with 14 days of oral antibiotics. Persons for whom the exposure time is uncertain can be observed and treated if fever or symptoms of infection develop within 14 days of presumed exposure. Antibiotic prophylaxis is most effective if given within 24 hours of exposure. Persons with symptomatic tularemia should receive a 10-14 day course of antibiotics (length of treatment course depends on antibiotic used).

Infection Control

Isolation is not recommended for tularemia patients because of the lack of person-to-person transmission. Because of the risk of infection to laboratory staff and the need for special culture media, the laboratory must be alerted when tularemia is present or suspected.
Summary of Key Points (Slides 17-18)

**Tularemia**

Summary of Key Points

- In naturally occurring tularemia, infection virtually always occurs in a rural setting. Infection in an urban setting with no known risk factors or contact with infected animals suggests a possible deliberate source.

- Tularemia is not transmitted person to person.

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**Tularemia**

Summary of Key Points

- The most likely presentations of tularemia in a BT attack are pneumonic and typhoidal disease, as opposed to cutaneous disease in naturally occurring cases.

- Tularemia can be treated and prevented with antibiotics.
Viral Hemorrhagic Fevers (Slides 19-34)

Summary of Key Points
(Listed in slides 33-34)
1. A thorough travel and exposure history is key to distinguishing naturally occurring from intentional viral hemorrhagic fever cases.
2. Viral hemorrhagic fevers can be transmitted via exposure to blood and bodily fluids.
3. Contact and airborne precautions are recommended for health care workers caring for infected patients.

Overview of Causative Agents (Slides 19-23)

VHF are zoonotic diseases; rodents and arthropods are the main reservoirs for infection. The illness course, geographic occurrence, and animal and arthropod reservoirs differ among the VHF agents, but the target organ (vascular bed) and initial presentation (febrile illness with coagulation abnormalities) is similar. Mortality rates vary by agent, from 0.5% reported for Omsk hemorrhagic fever to 53-92% reported in outbreaks of Ebola hemorrhagic fever. Only the arenaviruses and filoviruses are considered Category A agents.

Slide 20 shows an electron micrograph of the Ebola Zaire virus (Dr. F.A. Murphy, then CDC, now UC Davis; top), and extracellular virus particles budding from the surface of a Vero E6 tissue culture cell infected with an arenavirus (Cynthia Goldsmith, MS, Infectious Disease Pathology Activity, DVRD, NCID, CDC; bottom).
Under natural circumstances, humans are infected after contact with the natural host. This may occur through the bite of an infected arthropod, through inhaling aerosolized rodent excreta, or through contact with infected animal carcasses. Most cases have resulted from direct contact with blood, secretions, or tissues of infected patients or nonhuman primates.

Several VHF agents are transmissible from person to person, primarily through direct percutaneous exposure to blood and bodily fluids. Percutaneous exposure results in a high risk of infection. For filoviruses and arenaviruses, rare instances of airborne person-to-person transmission may occur, but this mode of transmission has not been convincingly established or ruled out. Laboratory workers are at risk for Rift Valley fever from inhalation of infectious aerosols during specimen processing. Rift Valley fever may also infect domestic animals after a biological attack, with potential establishment of the disease in the environment. Person-to-person transmission has not been described for Rift Valley fever and the flaviviruses (Yellow fever, Omsk hemorrhagic fever, or Kyasanur Forest disease). In general, standard infection control precautions including blood and bodily fluid precautions have been effective at interrupting transmission during outbreaks.
The agents are summarized in slides 22 and 23; only the arenaviruses and filoviruses are considered Category A agents.
Clinical Presentation (Slides 24-26)

Key Points

1. Not all infected persons develop a classic hemorrhagic fever syndrome, and specific signs and symptoms vary according to the specific type of VHF.

2. Initial signs and symptoms may include marked fever, fatigue, dizziness, muscle aches, weakness, and exhaustion. Severe cases may show bleeding manifestations ranging from petechiae to spontaneous bleeding.

3. Infection control measures for protection of health care workers should be implemented for suspected VHF cases.

The different VHF agents produce a spectrum of symptoms and clinical manifestations, complicating diagnosis. The incubation period for the viral hemorrhagic fevers ranges from 2-21 days, depending on the agent, and is followed by a prodromal illness lasting less than a week. Initial symptoms (slide 25) may include high fever, headache, malaise, joint or muscle aches, weakness, exhaustion, dizziness, nausea, abdominal pain, and non-bloody diarrhea. Illness onset is typically abrupt for the filoviruses, flaviviruses and Rift Valley fever; and more insidious with the arenaviruses.
VHF Surveillance

Clinical signs of VHF, listed in slide 26, reflect damaged blood vessels and bleeding, and can ultimately lead to shock. Conjunctivitis and pharyngitis may occur. Most diseases show a cutaneous flushing or skin rash.

The World Health Organization has developed surveillance criteria to assist in early identification of naturally occurring outbreaks of viral hemorrhagic fevers. A modified version of the WHO criteria, shown in slide 27, can be used to identify early VHF cases arising from a biological attack (Borio et al., 2002). Once the particular agent has been identified, a more specific case definition can be developed.
Treatment of Cases and Management of Exposed Persons (Slides 28-30)

Key Points

1. Treatment of viral hemorrhagic fevers is primarily supportive.
2. With the exception of Yellow Fever, there is no licensed vaccine or prophylaxis for the viral hemorrhagic fever viruses.

Treatment of viral hemorrhagic fevers is primarily supportive. Prophylaxis consists mainly of washing exposed body surfaces with soap and irrigating mucous membranes with water or saline. Argentine HF responds to therapy with two or more units of convalescent plasma given within eight days of disease onset. The use of convalescent plasma is investigational, and would most likely not be feasible during a biological attack, due to logistical difficulties and low supply. Ribavirin is an investigational treatment (i.e., given under an IND application) for VHF caused by arenaviridae or bunyaviridae. Ribavirin therapy should be initiated in individuals meeting the clinical surveillance criteria outlined in slide 27. If a diagnosis other than VHF from an arenavirus or bunyavirus is later made, ribavirin should be discontinued at that time.
Following a biological attack, all potentially exposed persons, as well as high-risk and other close contacts should be monitored for symptoms and fever, for 21 days beyond the exposure or last contact with an ill patient. High-risk contacts are those who have had mucous membrane contact with a patient (such as during kissing or sexual intercourse) or have had a percutaneous injury involving contact with the patient's secretions, excretions, or blood. Close contacts are those who live with, shake hands with, hug, process laboratory specimens from, or care for a patient with clinical evidence of VHF prior to initiation of appropriate precautions. Prophylaxis consists mainly of washing exposed body surfaces with soap and irrigating mucous membranes with water or saline.
Some VHF viruses may continue to be present in body fluids for long periods following recovery. Patients recovering from an arenavirus or filovirus infection should therefore refrain from sexual activity for three months after clinical recovery. Yellow fever is the only VHF with a licensed vaccine. Yellow fever antibodies take longer than the three- to six-day incubation period to appear, and thus this vaccine would not be useful for prophylaxis during a biological attack. There is limited experimental evidence that postexposure prophylaxis with ribavirin will delay onset of disease from arenaviruses, but not prevent it. The Department of Defense has a compassionate use protocol for prophylactic administration of oral ribavirin to high-risk contacts of Congo-Crimean hemorrhagic fever patients, and CDC guidelines recommend ribavirin to high-risk contacts of Lassa fever patients. The latter recommendations will be undergoing a review shortly, and may be revised. The Civilian Working Group for Biodefense does not recommend the administration of ribavirin to exposed individuals in the absence of signs or symptoms.
Infection Control (Slides 31-32)

Infection control precautions are outlined in slides 31-32. VHF are transmitted via contact with blood and bodily fluids. Hantaviruses are an exception: infectious virus is not present in blood or excreta at the time of clinical presentation. Health care workers should wash their hands prior to donning, and after removing, personal protective equipment (PPE). Hands should be cleaned prior to the removal of facial protective equipment, and after the removal of all PPE. Care should be taken to avoid touching mucous membranes during patient care and before washing hands. PPE should be changed between patients.

An adjoining anteroom is useful as a site for changing into and removal of protective clothing, supply storage, and decontamination of specimen containers. Airborne precautions require that the patient be placed in a room with negative air pressure, 6 to 12 air changes per hour, air exhausted directly to the outdoors or passed through a high-efficiency particulate air (HEPA) filter before recirculation, and doors kept closed. In mass casualty and other situations in which the use of negative air pressure rooms may not be feasible, all other infection control precautions (as outlined in slides 26-27) should be followed. Available evidence suggests that in the great preponderance of historical cases, these measures were sufficient to prevent transmission of disease to health care workers, family members, and other patients. The decision to use an N-95 mask versus a powered air purifying respirator (PAPR) should be made after considering the benefits and risks of each option in the specific situation. Disadvantages of the N-95 masks include the difficulty in ensuring a reliable face-mask seal with each use and impossibility of effective use by bearded individuals. PAPRs, on the other hand, are more expensive, bulky, impair voice communication, and may increase the risk of needlestick injuries.
Dedicated medical equipment (e.g., stethoscopes) should be used for VHF patients, to decrease the risk of transferring infection to other patients. Point of care analyzers are small, portable devices that can be used at the bedside for routine laboratory tests; they should be used, if available, to minimize exposure of laboratory personnel to infectious specimens. If point of care analyzers are unavailable, specimens should be double-bagged, hand-carried to the laboratory, and pre-treated with Triton X-100, as this may decrease viral titers. Pretreatment with Triton X-100 does not significantly alter serum electrolytes, urea nitrogen, creatinine, and glucose or liver function test results.

Embalming of deceased VHF patients should not be done. Autopsies should be performed only by specially trained persons using VHF-specific barrier precautions, HEPA-filtered respirators (N-95 masks or PAPRs), and negative-pressure rooms.
Summary of Key Points (Slides 33-34)

Viral Hemorrhagic Fevers
Summary of Key Points

- A thorough travel and exposure history is key to distinguishing naturally occurring from intentional viral hemorrhagic fever cases.
- Viral hemorrhagic fevers can be transmitted via exposure to blood and bodily fluids.

Case Reports (Slide 35)

Case Reports

- Tularemia
  MMWR Morb Mortal Wkly Rep 2001;50(33)
- Viral Hemorrhagic Fevers
  MMWR Morb Mortal Wkly Rep 2001;50(5)
Resources (Slides 36-38)
References

**General Bioterrorism Information and Web Sites**

http://www.acoem.org/member/trauma.htm


http://www.bioterrorism.slu.edu


http://pubs.ama-assn.org/bioterr.html


http://www.cdc.gov/ncidod/EID/eid.htm

http://www.doh.wa.gov

**Emergency Response Planning**

Bioterrorism and emergency response plan clearinghouse.
http://bt.nacchoweb.naccho.org/


CDC. Cooperative agreement U90/CCUXXXXXX-03-X public health preparedness and response for bioterrorism.
http://www.bt.cdc.gov/Planning/CoopAgreementAward/index.asp
http://www.bt.cdc.gov/Documents/Planning/PlanningGuidance.PDF


Environmental Protection Agency. Emergency planning and community right-to-know act overview.  
http://yosemite.epa.gov/oswer/ceppower.nsf/content/epcrOverview.htm


Medical response in emergencies: HHS role.  

http://www.phppo.cdc.gov/documents/localinventory.PDF

Washington state comprehensive emergency management plan.  
http://www.wa.gov/wsem/3-map/a-p/cemp/cemp-idx.htm

**Health Surveillance and Epidemiologic Investigation**

CDC. Case definitions under public health surveillance. MMWR; 1997:46(RR-10):1-55.


CDC Epidemiology Program Office. Excellence in curriculum integration through teaching epidemiology (Web-based curriculum).  
http://www.cdc.gov/excite/index.htm


Koo, D. Public health surveillance (slide set).  
http://www.cdc.gov/epo/dphsi/phs/overview.htm

Last Revised December 2002
List of nationally notifiable infectious diseases.  
http://www.cdc.gov/epo/dphsi/phs/infdis.htm


Diseases of Bioterrorist Potential

Advisory Committee on Immunization Practices (ACIP). Use of smallpox (vaccinia vaccine), June 2002: supplemental recommendation of the ACIP.

http://www.bt.cdc.gov/ncidod/hip/GUIDE/infectcont98.htm


Webcast: http://www.sph.unc.edu/about/webcasts/

Webcast: http://www.sph.unc.edu/about/webcasts/

CDC. Considerations for distinguishing influenza-like illness from inhalational anthrax. MMWR 2001;50(44):984-986.


Centers for Disease Control and Prevention. Smallpox vaccination and adverse events training module, 2002.  
http://www.bt.cdc.gov/training/smallpoxvaccine/reactions/default.htm

Centers for Disease Control and Prevention, American Society for Microbiology & American Public Health Laboratories. Basic diagnostic testing protocols for level A laboratories.  
http://www.asmusa.org/pcsrc/biodetection.htm#Level%20A%20Laboratory%20Protocols


Working Group on Civilian Biodefense Consensus Recommendations:


Environmental Sampling and Decontamination


CDC. Use of onsite technologies for rapidly assessing environmental Bacillus anthracis contamination on surfaces in buildings. MMWR. 2001;50(48):1087.


Environmental Protection Agency. EPA’s role in responding to anthrax contamination. http://www.epa.gov/epahome/hi-anthrax.htm#FORAGE.


Last Revised December 2002
**Consequence Management**


CDC. Interim recommendations for the selection and use of protective clothing and respirators against biological agents http://www.bt.cdc.gov/DocumentsApp/Anthrax/Protective/10242001Protect.asp


http://www.journals.uchicago.edu/CID/journal/issues/v34n2/011333/011333.html

**Psychological Aftermath of Trauma**


**Communication and Informatics**


Covello T, Peters RG, Wojtecki JG, Hyde RC. Risk communication, the West Nile Virus epidemic, and bioterrorism: responding to the communication challenges posed by the intentional or unintentional release of a pathogen in an urban setting. J Urban Health: Bulletin of the NY Academy of Medicine 2001;78(2):382-391.

Appendix A: Modules (MS® Powerpoint files)

**Introduction to Bioterrorism**
One module (33 slides)

**Emergency Response Planning**
One module, with one custom show for personnel without planning oversight responsibilities
- Public health leaders (36 slides)
- Other public health staff (24 slides)

**Diseases of Bioterrorist Potential**
Six modules
- Overview (25 slides, with 20-slide custom show for staff without health care responsibilities)
- Anthrax (29 slides)
- Smallpox (44 slides)
- Plague and Botulism (33 slides)
- Tularemia and VHF (38 slides)
- Environmental Sampling and Decontamination (43 slides)

**Health Surveillance & Epidemiologic Investigation**
One module (32 slides)

**Consequence Management**
Three modules
- Public health leaders (51 slides)
- Public health professional staff (51 slides)
- Other public health staff (30 slides)

**Communication & Informatics**
One module (42 slides)
Appendix B: Glossary

**Bulbar:** Referring to the cranial nerves

**Coagulopathy:** A disease affecting the coagulability (clotting) of the blood

**Confluent:** Joining, running together

**Conjunctivitis:** Inflammation of the conjunctiva; “red eye”

**Depigmentation:** Loss of pigmentation (color)

**Diplopia:** Double vision

**Dyspnea:** Shortness of breath

**Edema:** An accumulation of an excessive amount of watery fluid in cells or tissues

**Enanthem:** A mucous membrane eruption (rash)

**Epistaxis:** Nose bleed

**Erythema:** Redness

**Eschar:** A thick, coagulated crust or slough

**Exanthem:** A skin eruption (rash) occurring as a symptom of an acute viral or coccal disease

**HAZMAT:** Hazardous materials management; HAZMAT workers respond to discharges and/or releases of oil, chemical, biological, radiological, or other hazardous substances.

**Hematemesis:** Vomiting of blood

**Hemoptysis:** Coughing up blood

**Hemorrhagic mediastinitis:** Bloody inflammation in the chest cavity

**Hypotension:** Low blood pressure

**Indolent ulcer:** Chronic ulcer, showing no tendency to heal

**Leukocytosis:** Elevated white blood cell count

**Lymphadenitis:** Inflammation of a lymph node or lymph nodes
Lymphadenopathy: A disease process (e.g., swelling) affecting a lymph node or nodes

Macule: A small, discolored patch or spot on the skin, neither elevated above nor depressed below the skin's surface

Malaise: General ill feeling

Myalgia: Muscle aches

Papule: A small, circumscribed solid elevation on the skin

Percutaneous: Denoting the passage of substances through unbroken skin; passage through the skin by needle puncture

Petechiae: Pin-head sized hemorrhagic spots in the skin

Pharyngitis: Inflammation of the tissues of the pharynx; “Sore throat”

Pleuropulmonary: Relating to the pleura and the lungs

Preauricular: Anterior to the auricle of the ear

Prodrome: An early or premonitory symptom of a disease

Prophylaxis: Prevention of a disease, or of a process that can lead to disease

Prostration: A marked loss of strength, as in exhaustion

Pustule: A small circumscribed elevation of the skin, containing purulent material

Sepsis: The presence of various pus-forming and other pathogenic organisms, or their toxins, in the blood or tissues

Stomatitis: Inflammation of the mucous membrane of the mouth

Vesicle: A small, circumscribed elevation on the skin containing fluid (i.e., blister)

*Reference: Stedman’s Medical Dictionary, 26th Ed.*
Preparing for and Responding to Bioterrorism
Instructor’s Manual Series

In the wake of the 2001 anthrax attacks, thousands of people and organizations across the country have scrambled for information on how to protect themselves, their families, and their employees from anthrax and other potential agents of bioterrorism. Health officials have been flooded with requests to deliver presentations on bioterrorism preparedness and response at community forums, clinical conferences, business meetings, and other public venues. Potential instructors and trainers, however, have been handicapped by the lack of up-to-date, basic orientation resources on bioterrorism preparedness and response.

Preparing for and Responding to Bioterrorism: Information for the Public Health Workforce is a series of train-the-trainer resources that addresses the public health aspects of bioterrorism. It is scientifically accurate, up-to-date (as of the date of publication), and immediately relevant to the public health workforce. The series consists of thirteen PowerPoint™ slide sets, each accompanied by a detailed instructor’s manual. The slide sets cover emergency response planning, surveillance and epidemiologic response, diseases of bioterrorist potential, consequence management, and communication and informatics. They are flexible and can be customized for local community needs. Included in each slide set and instructor’s manual is a list of resources, references, and contacts for further information on bioterrorism preparedness and response—before, during, and after an incident.

We hope these resources will help the public health workforce to plan for and respond to public health emergencies, including a bioterrorist attack, and facilitate coordination between public health and other emergency responders.

Cover image: Lassa Fever virus

Northwest Center for Public Health Practice
School of Public Health and Community Medicine, University of Washington
1107 NE 45th St., Suite 400, Seattle, Washington 98195
Phone (206) 685-2931 • Fax (206) 616-9415