CLARIFICATION AND VALIDATION OF NEED FOR EDUCATIONAL/INFORMATIONAL MATERIALS TO SUPPORT RECOVERY FROM A WIDE-AREA RELEASE OF ANTHRAX

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Clarification and Validation of Need for Educational/Informational Materials to Support Recovery from a Wide-Area Release of Anthrax

KS Judd
AM Lesperance
SL Stein

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# Table of Contents

Introduction.................................................................................................................................................................. 1  
Approach................................................................................................................................................................. 1  
Summary of Findings.............................................................................................................................................. 2  
  Review of Web Resources................................................................................................................................... 2  
  Interviews............................................................................................................................................................... 3  
Conclusions............................................................................................................................................................... 6  
Appendix A: Interview Protocol.............................................................................................................................. A-1  
Appendix B. Description of Web sites with Significant Content on Anthrax......................................................... B-1
Introduction

During August 2008, the Pacific Northwest National Laboratory (PNNL) led a series of workshops with businesses, building owners, and critical service providers in the Seattle urban area to identify their priority needs to support restoration and recovery efforts after a wide-area anthrax release. One of the needs identified by workshop participants was a better understanding of anthrax from a health and a remediation perspective.

In response to this need, the Defense Threat Reduction (DTRA) agency asked PNNL to develop educational/information briefs or other resources that the private sector could use to guide emergency response and recovery activities and support communications with their employees, tenants, and other stakeholders. PNNL took steps following the workshop to better define available resources and the specific needs of the private sector in the Seattle urban area related to information on anthrax. This report summarizes the findings from that effort and will be used to guide development of relevant materials under the follow-on project supported by DTRA.

Approach

This task involved a web scan for published information sources on anthrax and follow-up interviews with workshop participants. Web searches focused on credible public health, emergency response and remediation sources, such as the Centers for Disease Control (CDC), state and local public health departments, the Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA).

Interviewees included:

- Joe Donovan, Beacon Capital Partners
- Bryan Reagan, Premera Blue Cross
- Bob Hutchins, Unified Grocers
- Gabriel Marcus, Costco
- Hilarie Milligan, Unigard Insurance
- Ron Kamps, Liberty Mutual Insurance
- Don Wise, Metzler Realty Advisors
- Thomas Austin, Boeing
- Anne Newcombe, Harborview Medical Center

A select set of web-based resources identified through the review of published material was shared with interviewees prior to the telephone interviews. The interviews aimed to
determine whether the business continuity professionals were familiar with the resources and whether the existing resources adequately addressed their information needs for an anthrax event. See interview protocol in Appendix A.

Summary of Findings

Review of Web Resources

Published information on a wide variety of topics on anthrax, such as diagnosis, detection, treatment, work safety guidelines, and worksite clean-up, is currently available on the Web sites of several government and research organizations. The most detailed and comprehensive information is available from the Centers for Disease Control (CDC), National Institutes of Health (NIH), Occupational Health and Safety Administration (OSHA), and the University of Pittsburgh Medical Center - Center for Biosecurity. The general content of these and other Web sites that may be used for reference on anthrax and its remediation are described below and a more comprehensive summary with URL addresses and screen shots can be found in Appendix B.

Centers for Disease Control
The CDC provides extensive information and fact sheets on anthrax for both healthcare providers and the general public. Content of the CDC Web site includes a summary of what anthrax is, how it is transmitted, signs and symptoms, diagnosis and evaluation, detection and sampling guidance, exposure management and treatment, infection control, and basic work safety advice.

National Institutes of Health
The NIH’s MedLine Plus Web site includes illustrations and very brief descriptions of anthrax definition, symptoms, causes, diagnosis, treatment, prognosis, possible complications, prevention, and other topics. Much of the content references material on the CDC. The NIH Web site also has an interactive multimedia tutorial with questions for the viewer.

Occupational Health and Safety Administration
The OSHA Web site provides information on anthrax in the workplace. It includes guidance assessing risk and suggests protective measures to reduce risk based on level of risk for a given workplace. It also includes a web-based training module for anthrax in OSHA’s eTools. In addition to the information above, eTools describes initial actions to take, such as who to call, and very general guidance on containing the site and the decontamination process.
Center for Biosecurity

The University of Pittsburgh Medical Center’s Center for Biosecurity Web site describes the use of anthrax as a biological weapon and provides an overview of anthrax signs and symptoms, transmission, infection control measures, treatment, prophylaxis, decontamination, and countermeasures.

Ready America

Ready America is a web-based resource developed by the U.S. Department of Homeland Security (DHS) aimed at educating and helping members of the general public prepare for and respond to emergencies, such as terrorist attacks. Ready America contains very high level information on responding to a biological threat – not specifically anthrax – including what to do during a declared emergency, what to do if you are potentially exposed, and what to do if you become aware of a suspicious substance.

Lawrence Berkeley National Laboratory

A resource of specific interest to the buildings community is a Web site developed by Lawrence Berkeley National Laboratory titled, “Advice for Safeguarding Buildings Against Chemical or Biological Attack”. The Web site provides guidance for responding to an indoor, outdoor, and unknown release; tools for advanced planning including the Building Vulnerability Assessment and Mitigation Program; and training aids for emergency responders and building operators.

Environmental Protection Agency

The EPA Web site has fact sheets on chemicals that were used to decontaminate anthrax spores in the 2001 anthrax attacks (e.g. bleach, chlorine dioxide, ethylene oxide). Fact sheets describe the chemical, when and how it is registered for use, getting a crisis exemption for its use, and generally how it is used for decontamination.

Department of Defense

The DoD’s anthrax Web site is targeted at service members and describes the DoD’s Anthrax Vaccine Immunization Program. In addition to vaccine effectiveness and safety, it describes the threat of anthrax to soldiers and general characteristics of the disease. The Web site includes separate education “toolkits” for clinicians, commanders, and individuals.

Interviews

Are existing resources adequate?

The interviewees reviewed several of the Web sites either prior to or during the interviews. Four of the nine interviewees were familiar with at least some of these information sources
on anthrax. One of those individuals had considered conducting an anthrax response drill and came across the information in preparation for the drill. Another had reviewed the information several years ago, and noted that the information available had improved significantly since first developed after the anthrax releases in 2001 – particularly the OSHA information.

All nine interviewees said the information available at these Web sites was helpful, and those not familiar with it previously were glad to know that the information existed. However seven of the nine interviewees said the information they reviewed, while helpful, was inadequate in terms of supporting their preparedness for anthrax response, restoration and recovery. Most agreed that the Web sites provided useful general and clinical information, but pointed to a lack of information on the operational aspects of anthrax response and recovery and specific treatment guidelines for healthcare providers. Specific information needs identified, which were not thought to be adequately addressed on the Web sites above, included:

- A clear, step-by-step approach to anthrax event response and remediation, perhaps on the OSHA Web site. The current OSHA description of how to address anthrax in the workplace was extremely vague according to some. One interviewee cited mold or asbestos mitigation guidance as a potential model for the type of clear procedural guidance that is needed for anthrax.
- Guidance appropriate for a wide area release of aerosolized anthrax. The guidance provided on the OSHA Web site is relevant for a single-building incident only (i.e. a contaminated envelope). It would be helpful to have guidance for both scenarios.
- A contact list of responsible agencies/public sector representatives that would support remediation efforts (e.g. EPA), as well as a list of private sector companies that are approved to support sampling/testing and remediation activities. It was noted that none of the Web sites clearly identify a responsible agency.
- Testing and remediation procedure information that is specific to different work environments. For example, in a large retail environment where there is a lot of merchandise shrink-wrapped in pallets, could the material be cleaned or is the assumption that it would all have to be disposed of? If so, how would it be cleaned in that type of environment? Would food be tested by the USDA or others to ensure that was safe? It was thought that this would help to quell the public’s fears about food safety.

**Interviewees want additional information on anthrax:**
- A stepwise approach to testing and remediation procedures
- Remediation contactor lists
- Remediation guidance specific to a wide-area release and different work environments
- How to interact with government officials
- Direction for employees and tenants
- How to avoid recontamination once clean
- Treatment guidance for medical professionals
Direction to provide to employees or tenants. For example, should they be sent home or are they safer at work than on the roads? Where should they get tested? What hospitals do they go to? When can they come back? While much of this is situation-specific information, the information needs should be outlined in advance so that answers could be quickly plugged in.

Guidance on how businesses and property owners should interact with local and state government officials during an exposure.

Once an area is cleaned, guidance on how to prevent recontamination in a building.

Estimates of cost and timing required to clean up a building.

Specific guidelines for healthcare professionals on approved treatment protocols (in "medical language") and guidance sheets for patients that have been treated (e.g. potential side effects, what to watch for). The latter would need to be available in several languages.

How would the information on anthrax be used?

In general, interviewees said the information would be maintained as reference material in corporate emergency management manuals and portals, and used only to support response efforts in the event of an anthrax release. One interviewee did not believe this type of information would be of interest to business continuity planners until there was another anthrax attack. Just one indicated that they would use it for preparedness to help create procedures for an anthrax drill.

What format would the materials need to be in?

Five of the nine interviewees indicated that having links to Web sites where the information resides would meet their needs. They did not see the need for a separate one-pager prior to an event. One cited the need for a simple summary document of available resources and links specifically for business continuity planners. This person thought Web sites provided a lot of detail and business continuity planners would not have time to read through all of the material to find what they needed.

One interviewee thought a short FAQ sheet to distribute to employees would be helpful. This might be a standard document to put in an anthrax appendix to an emergency management plan.

Another wanted a more detailed compilation of anthrax materials, which they described as a book they could pull off the shelf with everything they would need to know about anthrax.
Finally, one cited the need for a “Bio-event 101” training guide for building owners and businesses. This guide would clarify protocols for response and cleanup and point to other resources where people could get more timely information on steps to be taken.

It was thought that all of the information should be available in both paper and electronic format, in the event that internet access is impaired.

**Where should this information be accessible?**

Four interviewees cited the need for a single “go to” source for all anthrax-related health, response, restoration, and recovery information. One suggested that the Federal government sponsored Web site for pandemic flu ([http://pandemicflu.gov](http://pandemicflu.gov)) was a good example of a Web site that consolidates information from different sources on pan flu, and suggested something similar be developed for anthrax. Another described the need for a single Web site on anthrax that is scalable to the specific information needs of end users with different levels of sophistication (e.g. a large corporation or a small daycare facility). A third interviewee was more interested in a single Web site for preparedness and response to all types of hazards, including anthrax.

Three others indicated they would want the information to be accessible internally. For example, a company’s business continuity team might include the anthrax information and links in their corporate emergency management web portal. Another envisioned adding anthrax materials as an appendix to their company’s emergency management plan.

Finally, two people mentioned the importance of pushing information out to the business continuity community to raise awareness about existing anthrax-related resources. An organization such as the Washington State Emergency Management Department might be appropriate to send out a quarterly email with reminders and tips about the type of information and resources that are available to support preparedness and where they can be found, including information on anthrax.

**Conclusions**

During a series of workshops with private sector businesses, building owners and operators, and critical service providers, business continuity professionals identified the need for educational materials, information briefs and other resources to help guide emergency response and restoration activities for a wide area release of anthrax. This document attempts to clarify the specific information needs of those private sector participants with respect to anthrax, and reviews currently published information from web-based resources that address some of these information needs.
A web-based search on emergency response and restoration related information on anthrax found that the CDC, NIH, OSHA and the UMPC Center for Biosecurity have the most detailed information to help users understand anthrax as an agent of bioterrorism. Most is presented in a simple question and answer format and written for a non-technical audience. Other resources of interest included very general guidance on responding to suspected anthrax event on the Ready America Web site, which is aimed at the general public; some information and tools on safeguarding buildings from a biological attack, which were developed by Lawrence Berkeley National Laboratory; and a description of chemicals used in anthrax remediation on the EPA’s Web site.

Follow-up discussions with workshop participants suggest that business continuity professionals found these web-based resources to be helpful but lack much of the information they require. The health and clinical information was thought generally to be adequate for the needs of business continuity planners, but not medical professionals. The operational information was considered by most to be inadequate to support response and restoration from an anthrax event. A key gap highlighted was the need for more detailed, specific step-by-step procedures to support sampling/testing and remediation. This should include guidance that is tailored to different scenarios (e.g. a wide area release vs. a single building contamination) and different work environments (e.g. a large retail warehouse vs. an office building).

As a follow-on activity to this study, it is recommended that DTRA, DHS or other appropriate representatives:

- Consolidate the list and description of existing web resources and find appropriate mechanisms for sharing with business continuity professionals in the region. Incorporate this information into the regional plan and national guidelines being developed under IBRD.
- Develop and work with appropriate Federal agencies to publish clear operational guidance for remediation in a wide area release scenario.
- Create a list of private sector contacts qualified in anthrax remediation activities and public sector agencies responsible for such an event and make it available to the private sector through appropriate channels.
- Prepare a list of FAQs and probable answers (or identify who would have appropriate answers during an event) needed by businesses and building owners for their employees and tenants.
- Consider the value of a central web portal for information on anthrax response, restoration and recovery.
Appendix A: Interview Protocol

Following the workshops we conducted last August to identify priority needs of private sector to support restoration and recovery efforts after a wide-area anthrax release, we worked with the IBRD program to define a set of follow-on activities that would address some of those needs and others identified by IBRD stakeholders.

One of the areas we are exploring further is the need for educational/information briefs on anthrax and the effects of exposure. To make sure that any information briefs or tools developed will adequately address the needs of the intended end users, we would like your help to better define the content of these materials and understand how you might use the information to prepare for a wide-area anthrax release.

1. Do existing web resources, such as those below, provide access to the information you need to support anthrax restoration and recovery or is there critical information missing?
   - CDC http://www.bt.cdc.gov/agent/anthrax/
   - University of Pittsburgh Medical Center – Center for Biosecurity: http://www.upmc-biosecurity.org/website/focus/agents_diseases/fact_sheets/anthrax.html

2. How would the information on anthrax be used by your organization?

3. What form would the materials need to be in to be useful to your organization? Are the links to information on Web sites adequate or do you require it in some other summary format?

4. Where would this information be accessible to be of value to you? Are the above-mentioned Web sites appropriate or are there other places / portals that would make more sense for your organization to access?
Appendix B. Description of Web sites with Significant Content on Anthrax

Centers for Disease Control

The CDC provides extensive information and fact sheets on anthrax-related topics. (See Figure 1 and http://www.bt.cdc.gov/agent/anthrax/). This information appears to have been last reviewed in 2006.

![Image of CDC Web site](https://example.com/cdc.png)

Figure 1. Anthrax information on CDC Web site

Content of the CDC Web site includes:

- What you need to know – A short summary on what anthrax is, how one becomes infected, how dangerous it is, what the symptoms are, and how it is treated.
- Questions and answers – Short answers to FAQs related transmission, symptoms, preventative/vaccine, testing, treatment, and safety issues/mail.
- Fact sheets and overviews – Information for the general public (e.g. how to recognize or handle a suspicious package or envelope, a fact sheet for parents, anthrax information for mail handlers) and professionals (e.g. for health care providers, technical information about anthrax).
- Diagnosis and evaluation – Clinical presentation (signs and symptoms), diagnosis, guidelines for clinical evaluation, historical information / lessons learned from 2001 anthrax attacks.
- Environment/Response – Detection and sampling guidance (e.g. Responding to Detection of Aerosolized *Bacillus anthracis* by Autonomous Detection Systems in the Workplace and Comprehensive Procedures for Collecting Environmental Samples for Culturing *Bacillus anthracis*), worker safety and protection for cleanup workers, and links to research articles (e.g. HEPA/Vaccine Plan for Indoor Anthrax Remediation,) and historical archives on the 2001 outbreak and sampling methods.
- Exposure Management/Prophylaxis – Preventative therapy, treatment, specific drug information (e.g. cipro).
- Images of anthrax
- Infection control – Guidelines for protecting sampling investigators, first responders, healthcare facilities.
- Lab testing – Specimen collection and shipping and lab protocols.
- Preparation and planning – Communication (the first hours), response planning, scenarios and modeling.
- Surveillance and investigation – Illness recognition and detection.
- Training and education – Educational videos and video webcasts on the history of bioterrorism using anthrax, protecting the health of people who process, sort, and deliver the mail, and clinical information for physicians.
- Treatment – Patient information on specific drugs used to treat anthrax and guidelines for prophylaxis.
- Vaccination – Availability and guidelines.
- Work safety – Basic advice and suggested protective measures for employers, guidance for protecting building environments, and protection of response and cleanup workers.
- References

*National Institutes of Health*

The NIH’s MedLine Plus Web site addresses anthrax under both the “Health Topics” (see [http://www.nlm.nih.gov/medlineplus/anthrax.html](http://www.nlm.nih.gov/medlineplus/anthrax.html)) and “Encyclopedia” headings (see [http://www.nlm.nih.gov/medlineplus/ency/article/001325.htm](http://www.nlm.nih.gov/medlineplus/ency/article/001325.htm)). Information includes illustrations and very brief descriptions of anthrax definition, symptoms, causes, diagnosis, treatment, prognosis and other topics (See Figure 2). Many of these topics reference CDC weblinks. The NIH Web site also has an interactive multimedia tutorial with questions for the viewer. (See Figure 3 and [http://www.nlm.nih.gov/medlineplus/tutorials/anthrax/htm/index.htm](http://www.nlm.nih.gov/medlineplus/tutorials/anthrax/htm/index.htm).)
Anthrax

Anthrax is a disease caused by Bacillus anthracis, a microbe that lives in soil. Many people know about it from the 2001 bioterrorism attacks. In the attacks, someone purposely spread anthrax through the U.S. mail. This killed five people and made 22 sick.

Anthrax affects farm animals more often than people. But it can cause three forms of disease in people. They are:

- Cutaneous, which affects the skin. People with cuts or open sores can get it if they touch the bacteria.
- Inhalation, which affects the lungs. You can get this if you breathe in spores of the bacteria.
- Gastrointestinal, which affects the digestive system. You can get it by eating infected meat.

Antibiotics often cure anthrax if it is diagnosed early. But many people don’t know they have anthrax until it is too late to treat. A vaccine to prevent anthrax is available for people in the military and others at high risk.

Figure 2. Anthrax information on NIH Web site

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Figure 3. Audio presentation tutorial on anthrax available through NIH Web site
The OSHA Web site has two resources on anthrax. Under Safety and Health Topics (see [http://osha.gov/SLTC/bioterrorism/anthrax/index.html](http://osha.gov/SLTC/bioterrorism/anthrax/index.html) and Figure 4), the Web site offers information on anthrax, particularly concerning its use as a biological weapon. The site offers:

- Guidance on dealing with workplace exposures to anthrax, including appropriate Personal Protective Equipment (PPE), healthcare worker precautions, disposal of PPE, lab worker precautions, emergency response worker precautions, security personnel precautions, mail-related procedures, employee exposure, OSHA compliance and recordkeeping
- A description of who can be exposed
- Mail-handling guidelines
- Links to additional information on Biological Agents, Bioterrorism, Emergency Preparedness and Response, Hazard Communication, Hazardous Waste, PPE, Respiratory Protection

Another resource on anthrax is available through OSHA’s web-based training module called eTools. The anthrax eTool module was developed in December 2002 (Figure 5).
What training requirements exist for workers involved in anthrax response and remediation?

What types of personal protective equipment (PPE) are necessary?

Figure 5. Anthrax information on OSHA’s eTools Web site

Anthrax eTools content is summarized below:

- What is anthrax?
  - What is Bacillus anthracis?
  - How can I be exposed to Bacillus anthracis?
  - What are the symptoms of anthrax?
  - What are the incidence rates of anthrax?
  - How is anthrax diagnosed and treated?
  - Is there a way to prevent infection?
  - Links to additional information on Bacillus anthracis and anthrax.

- Who is at risk?
  - The Anthrax Risk Reduction Matrix
  - Workers Exposed Through Criminal/Terrorist Acts
  - Emergency Response Workers
  - Health Care Workers Animal Handling and Related Occupations

- How do I prepare?
  - Emergency Action Plan
  - Mail-handling Procedures

- What if I have a threat at my worksite?

- How do I clean up by worksite that has been contaminated with anthrax?
  - What first response actions should be taken?
  - What Health and Safety Plan (HASP) requirements exist at anthrax contaminated sites?
  - What training requirements exist for workers involved in anthrax response and remediation?
  - What types of personal protective equipment (PPE) are necessary?
What are the employee medical program requirements?
How do I sample and analyze for anthrax?
What is a Transition Program and what elements should I include in my Transition Program?
Links to Additional Anthrax Response Information

**Center for Biosecurity**

The University of Pittsburgh Medical Center’s (UPMC) Center for Biosecurity Web site describes the use of anthrax as a biological weapon and provides an overview of anthrax signs and symptoms, transmission, infection control measures, treatment, prophylaxis, decontamination, and countermeasures. The information is available in a 4-page PDF fact sheet updated in November 2007 (Figure 6). See [http://www.upmc-biosecurity.org/website/focus/agents_diseases/fact_sheets/anthrax.html](http://www.upmc-biosecurity.org/website/focus/agents_diseases/fact_sheets/anthrax.html).

![Figure 6. Anthrax information on UPMC’s Web site](http://www.upmc-biosecurity.org/website/focus/agents_diseases/fact_sheets/anthrax.html)

**Ready America**

Ready America is a web-based resource developed by the U.S. Department of Homeland Security (DHS) to educate and help members of the general public prepare for and respond to emergencies, such as terrorist attacks. Ready America (see [http://www.ready.gov/america/beinformed/biological.html](http://www.ready.gov/america/beinformed/biological.html)) contains very high level information on responding to a biological threat (not specifically anthrax), including what
to do during a declared emergency, what to do if you are potentially exposed, and what to do if you become aware of a suspicious substance. The Web site also provides access to a 1-page biological threat visual guide, shown in Figure 7 below.

![Figure 7. Anthrax information on Ready America Web site](image)

**Los Alamos National Laboratory**

A resource of specific interest to the buildings community is a Web site developed by Lawrence Berkeley National Laboratory titled “Advice for Safeguarding Buildings Against Chemical or Biological Attack” (see Figure 8 and [http://securebuildings.lbl.gov/secure.html](http://securebuildings.lbl.gov/secure.html)). The information appears to have been last updated in 2005. The Web site provides:

- Guidance for responding to an indoor, outdoor, and unknown release
- Tools for advanced planning including the Building Vulnerability Assessment and Mitigation Program (BVAMP), a software tool to help building managers identify basic steps to secure buildings and develop building specific mitigation plans.
- Training aids (links to presentations and reports) for emergency responders and building operators
Environmental Protection Agency

The EPA Web site has fact sheets on chemicals that were used to decontaminate anthrax spores in the 2001 anthrax attacks, including: bleach, chlorine dioxide, ethylene oxide, hydrogen peroxide and peroxyacetic acid, methyl bromide, paraformaldehyde and vaporized hydrogen peroxide (see Figure 9 below and http://www.epa.gov/pesticides/factsheets/chemicals/chlorinedioxidefactsheet.htm). The fact sheets describe:

- the chemical
- when and how the chemicals are registered for use
- getting a crisis exemption for their use
- a general description of its use for decontamination.
Figure 9. Anthrax information on EPA’s Web site

**Department of Defense**

The Department of Defense's (DoD) anthrax Web site is targeted at service members and describes the DoD's Anthrax Vaccine Immunization Program. The Web site provides high-level talking points on:

- **The Threat**
  - Why anthrax is a top choice for use as a biological warfare agent
  - How several potential adversaries have worked to develop an offensive biological warfare capability using anthrax
  - How it was used as a biological weapon in the United States

- **The Disease**
  - The three types of anthrax infection
  - Infection timeline and symptoms
  - The fact that the most deadly type of anthrax is the type most expected on the battlefield

- **The Vaccine**
  - how it works
  - safety and side effects
  - general role vaccines play in keeping troops healthy
The Web site includes separate education “toolkits” for clinicians, commanders, and individuals.

Figure 10. Anthrax and vaccine information on DoD’s Web site