



Sentinel Laboratory¹ Procedures for the Clinical Laboratory

Did you know that the only bioterrorism attack against a community in U.S. history occurred here in Oregon and it was first discovered by a small clinical laboratory? In 1984 the Rajneeshees, a cult living in central Oregon, intentionally contaminated a number of salad bars in The Dalles, eventually resulting in 751 cases of *Salmonella enterica* Typhimurium infection. Increasing numbers of this organism were seen by a local clinical laboratory staff, who alerted public health officials.

In 1999 the Centers for Disease Control and Prevention (CDC) awarded funding to many state health departments to strengthen the public health response to bioterrorism. This money is being used to build both the epidemiological and laboratory capacity to help identify bioterrorism activities. A national network of laboratories capable of detecting and identifying the potential agents of bioterrorism has been created. The ultimate goal of this effort is to develop the nationwide Laboratory Response Network (LRN), a three-tiered system of laboratories based upon their analytical

capabilities, capacity to respond, and biosafety levels.

Clinical, veterinary and environmental laboratories serve a critical role in this Laboratory Response Network. Their heightened awareness to the possibility of recovering the agents of bioterrorism from specimens and referral of suspect isolates to the Oregon State Public Health Laboratory (OSPHL) are crucial.

Bioterrorism can be defined as the "intentional use of microorganisms, or toxins, derived from living organisms, in furtherance of political or social objectives, to produce death or disease in humans, animals, or plants." A bioterrorism attack may be either overt or covert.

An overt attack would be accompanied by an announcement that an agent was released. These attacks elicit an immediate response by law enforcement and hazmat personnel. Public health officials will also be involved to help evaluate the credibility, risk and control the spread of disease. Samples would normally be sent directly to the OSPHL for processing.

A covert attack involves the release of an organism or toxin without an announcement. Days or weeks may pass before the release is noticed. The event would probably be signaled by a cluster of disease, appearing after the incubation period. Emergency departments may be

¹ formerly known as Level A Laboratories

the first to observe unusual patterns of illness while the sentinel clinical laboratories would almost certainly detect these first cases of disease. Organisms would be forwarded to the OSPHL and public health officials would be notified of a possible bioterrorism incident. They would then confirm that an attack has occurred, identify the organism and prevent further casualties by specific prevention strategies.

Bioterrorism Laboratory Classifications

Sentinel Laboratory¹

Sentinel laboratories have a minimum biosafety level of BSL-2. These laboratories may be involved in early detection and will be capable of recognizing agents that could be used for bioterrorism and perform selected tests

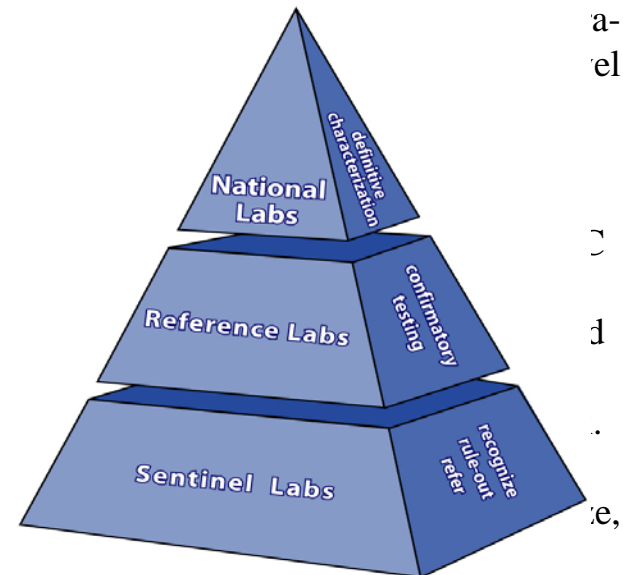
to rule them out. If a sentinel lab is unable to rule out an agent of bioterrorism, they will refer isolates to a reference laboratory, which in Oregon is the OSPHL.

Reference Laboratory²

Reference laboratories have a minimum biosafety level of BSL-2 with BSL-3 practices. In Oregon, the OSPHL is capable of rapid confirmatory identification of organisms referred by sentinel labs. Reference labs are also capable of a rapid response to announced events and will forward specimens to national labs for definitive characterizations.

National Laboratory³

Some public health, federal and academic labs are capable of advanced



- ¹ formerly known as Level A Laboratories
- ² formerly known as Level B Laboratories
- ³ formerly known as Level C and Level D Laboratories

OSPHL is considered a reference laboratory for *Bacillus anthracis* and a national laboratory for *Yersinia pestis*, *Francisella tularensis*, *Brucella* spp. and *Clostridium botulinum*.

Who to Contact

If you have any questions about isolating, identifying or submitting an organism that may be an agent of bioterrorism, contact the **Oregon State Public Health Laboratory at 503-693-4100** during regular business hours. If you need to call at other times contact the Oregon Public Health Division emergency number, 971-673-1111, and ask the individual on-call to contact the OSPHL.

If you have other general questions pertaining to bioterrorism, contact your local health department first. For further information, contact the Acute & Communicable Disease Program 971-673-0982.

Websites of Interest

Oregon State Public Health Laboratory -
<http://www.dhs.state.or.us/publichealth/phl/>

Centers for Disease Control & Prevention -
<http://www.cdc.gov>

Centers for Disease Control and Prevention bioterrorism home page -
<http://www.bt.cdc.gov>

Biosafety in the Microbiology Lab -
<http://www.cdc.gov/od/ohs>

Guidelines for Isolation Precautions -
<http://www.cdc.gov/ncidod/hip/>
Public Health Image Library -
<http://phil.cdc.gov/phil/>

CDC Emerging Infectious Diseases -
<http://www.cdc.gov/ncidod/eid>

American Society for Microbiology -
<http://www.asm.org>

Association for Professionals in Infection Control and Epidemiology (for the Bioterrorism Readiness Plan template for healthcare facilities, click on the "Resources" tab) -
<http://www.apic.org>

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

Videos & Educational Trainings

The OSPHL has a number of videos and training materials available to loan. Please call the Laboratory Response Network at 503-693-4123 for titles and more information. Funding for these training materials is from the Centers for Disease Control and Prevention Grant # U90/CCU017007.



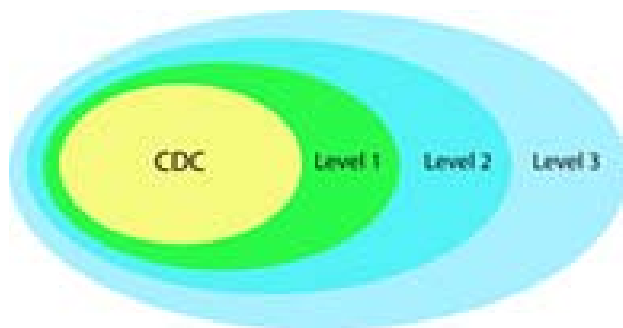
Published Materials

American Society for Microbiology: The ASM Cumitech on bioterrorism, "Laboratory Safety, Management, and Diagnosis of Biological Agents Associated with Bioterrorism" (number 33) provides the latest information for sentinel laboratories.

Disclaimer: Vendor names and manufacturers are provided as examples of suitable product sources and do not imply endorsement by the Centers for Disease Control and Prevention or the Laboratory Response Network and Oregon State Public Health Laboratory.

Oregon's Chemical Terrorism Program

The Oregon Laboratory Response Network (LRN) for the Chemical Terrorism (CT) Program is the state-level component for the CT Preparedness and Response section for the Centers for Disease Control and Prevention (CDC). CDC operates at the national level and oversees the CT programs for all states and territories within the United States. The CDC CT Programs within the various states and territories operate laboratories at levels designated as Level 3, 2, or 1 (L3, L2, & L1). The Oregon State Public Health Laboratory serves as a Level 3 facility – the lowest technical level. The actual CDC laboratory represents the highest laboratory technical level.



Level-3 Laboratories:

All state-level LRN CT members (L3, L2, & L1) participate in Level 3 activities. Level 3 laboratories are responsible for:

- ♦ Working with hospitals in their jurisdiction
- ♦ Knowing how to properly collect and ship clinical specimens
- ♦ Ensuring that specimens, which can be used as evidence in a criminal investigation, are handled properly and chain-of-custody procedures are followed
- ♦ Being familiar with chemical agents and their health effects
- ♦ Training on anticipated clinical sample flow and shipping regulations; and
- ♦ Working to develop a coordinated response plan for their respective state and jurisdiction.

Level-2 Laboratories

Forty-one labs also participate in L2 activities. At this level, laboratory personnel are trained to detect exposure to a limited number of toxic chemical agents in human blood or urine. Analysis of cyanide and toxic metals in human samples are examples of Level 2 laboratory activities.



Level-1 Laboratories:

Five laboratories participate in Level 1 activities. At this level, personnel are trained to detect exposure to an expanded number of chemicals in human blood or urine, including all Level 2 laboratory analyses, plus analyses for mustard agents, nerve agents, and other toxic chemicals.

Who to Contact

If you have any questions about CT readiness for first receiver medical facilities, clinical laboratories, or first responders, contact the Oregon LRN Office at 503-693-4123. For more general laboratory information, contact the Oregon State Public Health Laboratory 503-693-4100

Websites of Interest

Centers for Disease Control Biological and Chemical Terrorism Laboratories

<http://www.bt.cdc.gov/labissues/>

Oregon State Public Health Laboratory

<http://www.oregon.gov/DHS/ph/phl/>