Biosafety Tips
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Biosafety Tips brings you practical approaches to biosafety or “news you can use.” If you are looking for a useful and sensible solution to a biocontainment problem or perhaps a reference to help convince a skeptical researcher of the need for caution, this is the place to look. In this column I will share some biosafety insights for managing a variety of workplace situations. I welcome feedback or suggestions for future topics. Please e-mail any comments or suggestions to karen_byers@dfci.harvard.edu or to Co-Editor Barbara Johnson at barbara_johnson@verizon.net.

Are clinical microbiology laboratorians enrolled in the LPS program at risk?

Clinical microbiological laboratories are sentinels in the Laboratory Response Network; their role is to do the initial identification of possible biologic terrorism agents and to submit isolates to designated reference laboratories to confirm the identification. Since Category B pathogens (see NIAID web site) are infrequently isolated, the Centers for Disease Control and Prevention, the College of American Pathologists (CAP), and the American Public Health Laboratory (APHL) have developed the Laboratory Proficiency Survey (LPS), a voluntary proficiency-testing program. A kit of “unknown,” or Category B pathogens, is sent to 1,316 laboratories in the United States and Canada that voluntarily participate in the LPS (CDC, 2007). This column summarizes an MMWR report of Brucella exposures from a 2007 LPS exercise sent out with written directions requiring that all samples be handled inside a “Class II Biological Safety Cabinet using BL3 primary barriers and safety equipment.” It should be noted that, as a condition for receiving samples, the participating laboratories confirmed that a biosafety cabinet was available, and training in biosafety and shipping had previously been provided to participating laboratories in 2006. So, the big question is “What went wrong?”

Initially, a laboratory incorrectly labeled an LPS sample of Brucella abortus RB51 as a patient isolate and sent it to the New York State Department of Health (NYSDOH) laboratory for confirmatory testing. Because the isolate was mislabeled, it was handled using routine benchtop procedures, and this resulted in the potential exposure of 24 staff members to RB51 (CDC, 2007). After reporting the exposures to the CDC, NYSDOH conducted a survey of participating laboratories in its state. In November 2007, the New York Public Health Laborato-
laxis (PEP) was offered to both high-risk and low-risk exposed staff; unlike other Brucella species, serological monitoring for infection cannot be used with RB51. The percentage that accepted PEP is not known. Fortunately, no infections were reported. The report recommends that the critical ASM Procedures for manipulating potential bioterrorist agents be incorporated into routine bench procedures (ASM, 2004; CDC, 2008a).

The good news is that potential exposures were reported, the response was swift, and the CDC is actively involved in reviewing the current standard of practice in clinical microbiology laboratories. Professional organizations, including ABSA, ASM, and APHL, will be involved in developing recommendations to improve the occupational safety of clinical microbiologists. However, we should all consider the important, unanswered question in this report: Why were the instructions disregarded? An informal, conversational survey of bench microbiologists offered these answers:

- The letter with the instructions did not accompany the sample to the processing area.
- The letter did reach the clinical microbiologist, but the terms in the instructions were unfamiliar and difficult to interpret in terms of routine procedures and automated equipment, so they did not lead to action.
- Medical technicians who do not routinely work in microbiology may perform procedures at night and on weekends; they are not as experienced in BSL-3 practices.
- The staff member processing the sample did not receive the APHL training provided in 2006; and the notebook of training materials is not accessible to all staff.
- “Our professional ethics require that we handle the proficiency testing samples like we would any diagnostic sample.”
- The biosafety cabinet was not available because another staff member was using it.
- A biosafety cabinet was available, but clinical labs are so understaffed and staff is so overworked that they did not feel they had time to move to the biosafety cabinet, put on additional PPE, etc.
- Use of the biosafety cabinet is unfamiliar; work on the bench is routine.
- Respirators are uncomfortable; air conditioning in laboratories is inadequate.

In summary, the 2007 LPS training exercise yielded important lessons. The MMWR recommends that the ASM Procedures for handling Category B pathogens be incorporated into microbiology bench procedures. With regular reinforcement, this step will eliminate or minimize potential exposures (CDC, 2008b). The lessons learned are not limited to proficiency-testing exercises, since the standard advice to physicians when a bioterrorist agent is suspected is to write instructions such as “Rule out Brucella” or “Rule out Tularemia.” When these instructions appear, clinical microbiologists should be prepared to move away from the bench and take required precautions in order to work safely.

References


National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH). Biodefense. NIAID Category A, B, and C priority pathogens. Available at: www3.niaid.nih.gov/topics/BiodefenseRelated/Biodefense/research/Cata.htm