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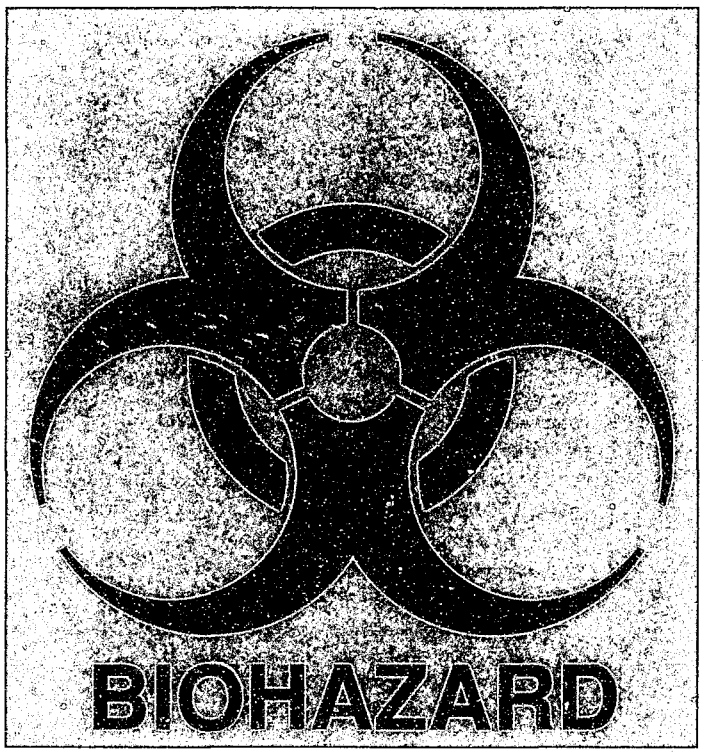

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Crime Laboratory Safety and the Bloodborne Pathogen Standard

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Crime laboratory directors in the United States are faced with a myriad of regulations associated with laboratory safety. The health and safety of laboratory personnel are critically important to the organization and to the individuals. Prevention is the preferred method of handling safety issues. Exposure to bloodborne pathogens, including AIDS and hepatitis B, in the laboratory and at crime scenes must be minimized to insure the safety of all personnel.

In the United States, the Occupational Safety and Health Administration (OSHA) is responsible for formulating and enforcing regulations that protect employees who are exposed to hazardous material in the workplace. Previously, OSHA's regulations pertained to nonbiological hazards, but the recent problems associated with AIDS and hepatitis B contaminated blood prompted OSHA to formulate its first regulatory standard for biological hazards, known as the Bloodborne Pathogen Standard.

This paper, an overview of the Bloodborne Pathogen Standard, should not be used as a detailed guideline for implementing the standard. The OSHA standard itself should be referred to for details.

Many health professionals consider blood to be the most significant source of AIDS and hepatitis B in the workplace. The most common routes for occupational transmission include accidental percutaneous inoculation, or needlesticks, and contact of mucous membranes and nonintact skin with contaminated blood or body fluids. Compliance with the OSHA standard will greatly reduce the risk for such occupational exposure in the workplace.

The OSHA Bloodborne Pathogen Standard is found in Part 1910.1030 of Title 29 of the *Code of Federal Regulations*, which was published in the *Federal Register* on December 6, 1991. It became effective on March 6, 1992. The Department of Labor and OSHA published a booklet (OSHA Publication 3127) outlining this standard and various aspects of compliance. Much of the information presented in this article is taken from OSHA Publication 3127.

The compliance calendar from OSHA Publication 3127 for the Bloodborne Pathogen Standard is as follows:

3/6/92	Effective Date of Standard
5/5/92	Exposure Control Plan
6/4/92	Information and Training/Employee Hazard Communication
6/4/92	Record Keeping
7/6/92	Engineering/Work Practices
7/6/92	Personnel Protective Equipment
7/6/92	Hepatitis B Vaccination and Postexposure Follow-up
7/6/92	Labels and Signs
7/6/92	Housekeeping
7/6/92	Other Provisions

All crime laboratory directors and managers should refer to the complete standard, as well as OSHA Publication 3127, to develop their own exposure control plan.

An exposure control plan includes the following elements:

1. The determination of who is exposed to blood, human tissues, and fluids.
2. A procedure for evaluating the circumstances surrounding an exposure incident.
3. A schedule and method for implementing sections of the standard covering the methods of compliance, such as hepatitis B vaccinations, postexposure follow-up, communicating the hazard to employees, and record keeping.

Exposure Determination

Exposure determination must be based on the definition of occupational exposure without regard to personal protective clothing and equipment. Exposure is determined by reviewing job classifications within the work environment and listing exposures as two groups. The first group includes job classifications in which all of the employees have occupational exposure. When all employees have occupational exposure, it is not necessary to list specific work tasks. The second group includes those classfications in which some employees have occupational exposure, and specific tasks and procedures which cause exposure must be listed.

Communicating Hazards to Employees

By June 4, 1992, each employee in the United States who has a reasonable anticipation of occupational exposure should have received information and training on bloodborne pathogens. This training should be provided during normal working hours at no cost to the employee. The individual

providing the training must be knowledgeable, possess effective communication skills, and be able to answer any questions posed by employees. If new tasks are added to an employee's duties which change the exposure potential, additional training is required.

Employee training must include the following information:

1. How to obtain a copy of the OSHA regulation and an explanation of its contents.
2. Information on the symptoms and epidemiology of the bloodborne diseases.
3. An explanation of the exposure control plan and how to obtain a copy.
4. How bloodborne pathogens are transmitted.
5. Information on how to recognize tasks that might result in occupational exposure.
6. Explanation of the limitations of protective equipment and environmental controls.
7. Information on the types, selection, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment.
8. Information on hepatitis B vaccinations.
9. Who to contact in an emergency.
10. How to report and follow up an accidental exposure.
11. Information on warning labels, signs, and color coding.

The Bloodborne Pathogen Standard requires that employers maintain accurate training records for 3 years. These records must include training dates, content of the training, the qualifications of the trainer(s), and the name(s) and job title(s) of the trainer(s). Upon request, training records must be made available to the employee and regulatory agencies.

Preventive Measures

1. Employers must make the vaccination (hepatitis B series) available to all occupationally exposed employees.
2. If an employee elects not to have the hepatitis B vaccination series, he/she must sign a declination form (see Appendix A). Should the employee later decide to have the vaccination series, he/she may do so at no cost.
3. All personnel must observe universal precautions at all times. Universal precautions assume that all human blood, body fluids, and tissues are potentially infectious.

Methods of Control

1. Engineering controls used to reduce risk of exposure consist of, but are not limited to, biosafety cabinets, face shields, splash shields, impervious protective clothing such as laboratory coats, gowns, aprons, shoe covers, and latex gloves in combination with cut-resistant gloves, and containers for sharps and other contaminated materials.
2. Work practice controls include requiring personnel to wear protective equipment and wash their hands before leaving the work area, even if gloves have been worn. Eating, drinking, smoking, applying cosmetics, and handling contact lenses is prohibited in a contaminated area. Removing all protective equipment prior to entering lunchrooms, offices, and conference rooms is essential. Biological specimens are never stored in the same refrigerator with food or beverages. Mouth pipetting of biological fluids is prohibited. Biological specimens must be stored in leak-proof, puncture-resistant containers with biohazard labels. Only authorized personnel are permitted in the laboratory working area.
3. Good housekeeping practices are essential. All equipment must be maintained in a clean and sanitary condition. Reusable equipment must be decontaminated after each use. Working surfaces must be cleaned and decontaminated with an appropriate disinfectant after contact with blood or other potentially infectious materials. Contaminated broken glass shall be removed and placed in a proper receptacle, using tongs, forceps, or other suitable equipment. Minimal handling of contaminated laundry is also required, and personal protective equipment shall be used when handling contaminated laundry.
4. Waste that is contaminated with liquid, semiliquid, or dried/caked blood is classified as regulated waste and must be disposed of according to federal, state, and local regulations in closable containers that are labeled or color coded. All sharps must be disposed of as soon as feasible in designated containers located in close proximity to the work space.
5. The standard requires the labeling of all biological fluids, contaminated items, and regulated waste with biohazard labels. These labels are fluorescent orange or red-orange and display the biohazard symbol. These labels are not required if the biological hazards are placed in red containers or red bags.

Procedures and Record Keeping if an Exposure Occurs

1. When an exposure incident occurs, it must be reported immediately to a designated record keeper.
2. Following an occupational exposure in the workplace, immediate, confidential medical evaluation and follow-up treatment by qualified medical personnel must be provided at no cost to the employee.
3. Documentation of the route of exposure and circumstances related to the incident must be recorded.
4. If possible, the blood source must be identified, documented, and tested for HBV/HIV. Consent for testing must be obtained from the source individual in most cases. Legal counsel should be consulted.
5. The exposed employee shall be provided a written evaluation by a health care professional within 15 days of completion of the evaluation.

6. Records must be confidential and maintained for 30 years beyond the duration of employment. These records must provide the following information:
   a. The employee's name and social security number.
   b. The employee's hepatitis B vaccination status, including vaccination dates and any related medical records.
   c. The results of any examinations, medical tests, and postexposure treatment.
   d. A copy of the health care professional's written report.
   e. A copy of the information provided to the health care professional.

Records of training and accidental exposure must be made available upon request to the Director of the National Institute for Occupational Safety and Health (NIOSH) and the Assistant Secretary of Labor for OSHA. Training records also must be available to the employee, upon request.

References and Suggested Readings

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APPENDIX A

The following is a declination statement that the employee must sign if he/she declines the hepatitis B vaccination. It is taken directly from OSHA Publication 3127.

Declination Statement

I understand that due to my occupational exposure to blood or other potentially infectious materials, I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

_____ _____

Employee Signature Date

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