

Addressing blood borne pathogen hazards in the laboratory

Safe Science: Be Protected!

By Kenneth R. Roy, Ph.D.*



What are blood borne pathogen hazards?

Blood borne pathogens are bacteria, viruses and parasites found in human blood and other body fluids. They can infect and cause disease in humans. The two pathogens recently receiving the greatest attention are the Hepatitis B virus (HBV) and Human Immunodeficiency Virus (HIV). Other pathogens which can also be of concern are Herpes, Meningitis, Tuberculosis, Epstein-Barr Virus, Lyme Disease, Malaria, and Syphilis, to name a few.

How are blood borne pathogens spread?

Blood borne pathogens are transmitted in four basic ways:

Direct - by touching body fluids from an infected person. This includes contact with lesions, open wounds, or sores on the skin. Skin lining of the mouth, nose or throat, and eye contact/invasion, are additional avenues.

Indirect - by touching objects that have touched the blood or another body fluid of an infected person.

Airborne - by breathing in droplets that become airborne when an infected person coughs or sneezes.

Vector-borne - by receiving an infected animal or insect bite.

Although the most common means of spreading blood borne pathogens are

through IV drug use and sexual transmission, other avenues of transmission are operative. Sources of infectious materials include amniotic fluid, cerebrospinal fluid, pericardial fluid, peritoneal fluid, pleural fluid, semen, synovial fluid, saliva in dental procedures, vaginal secretions, or any other body fluid visibly contaminated with blood including urine, feces and vomit. Also of concern are all body fluids where it is not possible to differentiate between body fluids; e.g., unfixed tissue or organ, cell or tissue cultures or body samples from experimental animals infected with HIV or HBV.

Should laboratory science teachers be concerned about blood borne pathogens?

Based on the means of transmission, life threatening implications and an individual's right to confidentiality, the potential for blood borne pathogen infection raises several issues for science teachers in laboratory situations. The need for laboratory work in high schools and middle schools dealing with activities such as blood typing, cheek cell sampling, and urinalysis need to be addressed. The OSHA Blood borne Pathogen Standard states (29 CFR 1910.1030(d)(1)): Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials. Science teachers, supervisors and their employers need to secure safe alternatives to laboratory activities such as human blood typing, cheek cell sampling and urinalysis. The risk of unknown exposure is too high!

I. What is the OSHA blood borne pathogen standard?

OSHA's Blood borne Pathogens Standard 29 CFR Part 1910.1030, addresses the blood hazards in the workplace.

This standard covers all employees who it can reasonably be anticipated to have contact with blood and other potentially infectious materials. Science teachers certainly fall under this category and are therefore covered under the Blood borne Pathogens Standard.

III. What is the employer's responsibility?

Employers are required to identify in writing, tasks and procedures, and job classifications where occupational exposure to blood occurs. This is done without regard to personal protective equipment. Procedures for evaluating circumstances surrounding exposure incidents must also be addressed. OSHA requires annual review and training for this program.

OSHA mandates universal precautions in other words, treating any body fluids or materials as if they were infectious. The employer is to provide facilities and to make sure employees use them following an exposure. Procedures relative to needle sticks, regulated wastes, decontaminating equipment, proper labeling and minimized splashing and spraying of blood, must be established and implemented. Personal protective equipment such as gloves, masks, etc. must be provided at no cost to employees. Specific methods for disposing of contaminated sharps or contaminated waste in containers are also addressed.

IV. In summary, the employer is to:

- Develop an exposure control plan (ECP).
- Provide annual Blood borne Pathogen training.
- Implement engineering and work practice controls.

- Enforce use of personal protective equipment.
- Offer hepatitis B vaccine, exposure valuation, and follow-up.
- Use signs and labels to warn of potential hazards and exposure.

V. What are the hazard communication applications?

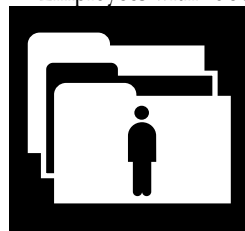
OSHA requires warning labels including orange or orange-red biohazard symbols affixed to containers of regulated waste, refrigerators/freezers or other containers used to store blood or other potentially infectious materials. Red bags can also be used in lieu of labeling.



VI. Is training required?

Within 90 days of effective employment and annually thereafter, Blood borne Pathogen Standard training is mandated. Training must include access of the regulatory text, explanation of its contents, general discussion of blood borne diseases, exposure control plan, engineering and work practice controls, personal protective equipment, Hepatitis B vaccine, response to emergencies involving blood, handling exposure incidents, post-exposure evaluation and signage. A question and answer opportunity must be provided by a trainer knowledgeable in the subject matter.

VII. What kind of records must be kept?



Employees with occupational exposure must have medical records kept on file for the duration of their employment, plus 30

years. These confidential records must include name, social security number, Hepatitis B vaccination status, results of any examinations, medical testing and follow-up procedures, and a health care professional's written opinion. Training records must be maintained for three years, including dates, contents of training program, trainers names and qualifications, names and job titles of all persons attending the sessions.

VIII. What protective measures should be taken?

There are four basic areas of precaution. They include the following:

Universal Precautions: Assume any exposure is contaminated if in contact with blood or other body fluid.

Engineering Controls: Use these controls for protection and decontamination; e.g., eyewash station, labeled disposal containers, etc.

Administrative Controls: Use appropriate procedures in working with glass, sharps, etc.

Personal Protective Equipment: Use aprons, goggles, gloves, etc.

What should be the responsibility of science teacher in an incident?

In most school systems, the science teachers responsibility in an incident is to keep students away from any exposure/contact to bodily fluids; e.g., blood, vomit, etc. Employer trained custodial or maintenance workers should be responsible for cleaning up the bodily fluids using appropriate techniques. Science teachers should keep a blood borne pathogens kit in their laboratory and classrooms at all times. The kit should include latex gloves, plastic bags and other appropriate materials. The school systems Blood borne Pathogen Plan should be consulted

for specific practices and policies.

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RESOURCES:

American Federation of State, County and Municipal Employees Website: <http://www.afscme.org/health/faq-bbp.ntm->

American Medical Association Website: <http://www.ama-assn.org/ama/pub/category/1805.html>

Center for Disease Control Website: <http://www.cdc.gov/ncidod/hip/BLOOD/blood.htm>

Health Canada Website: <http://www.hc-sc.gc.ca/hpb/lcdc/pubcat/pathogens/index.html>

Health and Safety Executive - UK - Website: <http://www.hse.gov.uk/new/index.htm>

National Institute of Occupational Safety and Health Website: <http://www.cdc.gov/niosh/homepage.html>

Department of Health - UK Website: <http://www.gov.uk/bbinf.htm>

Occupational Safety and Health Administration Website <http://www.osha.gov>

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