SAFE SCIENCE: BE PROTECTED!

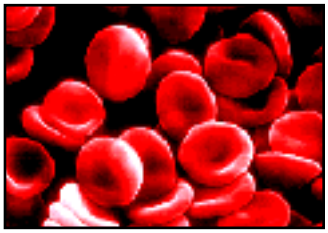
Revisiting bloodborne pathogens in the laboratory!

*By Dr. Ken Roy**

In The News - Unfortunately!

A city newspaper in Connecticut recently reported a story about two sets of parents who were intending on suing a town's board of education, a teacher and other school officials.

The intent to sue resulted from a safety incident which took place in the town's Alternative Middle and High School science laboratory. The teacher was having students do an experiment in which blood was viewed under a microscope.



Red blood cells

During the activity, several students shared the same safety pin to draw the blood sample. The teacher was quoted as saying she had students clean the pin with alcohol between sticks. The town health director was also quoted by the same newspaper noting, "Wiping the pin with alcohol was a good move, but that a different pin should have been used for each child."

The intent to sue was based on the fact that the blood test was conducted without proper parental notification or consent, proper safety procedures were not used and that the potential risks of the experiment were not disclosed. The students were reported as suffering from anxiety resulting from the fear of contracting a blood borne illness. The students have been forced to undergo testing for HIV, hepatitis and other diseases.

Why Is This Incident So Serious?

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.

Blood borne pathogens can be transferred by four different ways - direct, indirect, airborne and vector-borne. In this case direct and indirect proved to be the biggest threat:

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.

Allowing students at the middle school level to do blood work alone, never mind using the same needle, is not a prudent laboratory practice, given the risks involved. In addition, the strategy of using alcohol to render all Blood borne pathogens harmless is faulted and ineffective. The Center for Disease Control, OSHA and other regulatory agencies have clear prudent practices for this purpose.

Should Blood Work Be Done In Middle and High School Science Laboratories?

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. Although OSHA protects employees and not students, students involved in blood work create an unsafe working environment for employees. 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," Teachers as employees can just as easily be exposed to Blood borne pathogens from students as they can from other employees. Blood borne pathogens don't discriminate!

OSHAís Blood borne Pathogens Standard addresses the blood hazards in the workplace. This standard covers all employees who 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.

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!

Where Does The Buck Stop?

Based on the Blood borne Pathogen

" Teachers as employees can just as easily be exposed to Blood borne pathogens from students as they can from other employees. Blood borne pathogens don't discriminate! "

Standard, employers are required to identify in writing, tasks and procedures, and job classifications where occupational exposure to blood occurs. OSHA requires a written plan which is reviewed annually, in addition to 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

In summary, the employer is to:

- Develop an exposure control plan (ECP);
- Provide annual Blood borne Patho gen training;
- Implement engineering, work practice controls, and housekeeping practices;
- Provide and 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.

Was The Teacher Trained?

Within 90 days of implementation, when hired before work and whenever the hazard changes, Blood borne Pathogen Standard training is mandated. Minimally thereafter, annual training is required. Training must include access of the regulatory text, explanation of its contents, general discussion of bloodborne 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

What Should Be The Responsibility of Science Teachers In An Incident?

In most school systems, the science teacher's 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 system's Blood borne Pathogen Plan should be consulted for specific practices and policies.

Given this noted law suites and others already in progress, science teachers need to be trained in Bloodborne Pathogens and again, find safe alternatives. The quick knee jerk reaction on the part of administrators is to do away with the laboratory activities. If that was a logic resolution, there would be no cars on the road or airplanes in the air. Awareness, training and appropriate alternatives are the answer. Students need to learn about science by doing it through appropriate hands-on, process and inquiry based activities. Do the right thing: be informed, be prudent and plan ahead! If you do, the headlines hopefully won't come your way.

RESOURCES:

HYPERLINK "http://www.cdc.gov/niosh/homepage.html" http://www.cdc.gov/niosh/homepage.html - National Institute of Occupational Safety and Health Website

HYPERLINK http://www.osha.gov http://www.osha.gov - Occupational Safety and Health Administration Website

LIVE LONG AND PROSPER SAFELY!

* Dr. Ken Roy
Director of Science & Safety
Glastonbury Public Schools;
Authorized OSHA Instructor
Glastonbury, CT 06033-3099, USA
Email: royk@glastonburyus.org

✧✧✧