



IMPLEMENTATION OF A SAFETY-ENGINEERED SHARPS INITIATIVE AT A LARGE RESEARCH INSTITUTION

Lesley C. Homer, Dana L. Roof, Heather M. Peffer, Mark A. DiNardo, Tara Z. Balonick, Jay M. Frerotte, and Lawrence M. Milchak, Ph.D.

Department of Environmental Health and Safety, University of Pittsburgh, Pittsburgh, PA



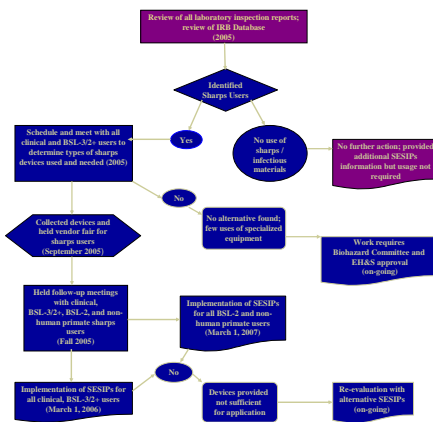
Abstract

In 2005, the University of Pittsburgh implemented an expanded safety-engineered sharps with injury protection (SESIP) program, to mitigate the risk of sharps injuries involving infectious agents outside of those described by the OSHA Bloodborne Pathogen Standard. After extensive risk assessment, groups with highest risk of exposure (researchers working with high-risk pathogens, with non-human primates, and with other BSL-2 agents, as well as those working with human subjects or patients) were identified. A review of the Institutional Review Board database, telephone and personal interviews, and the annual lab inspection program, provided the names of researchers in each group. A vendor fair in September, 2005 provided researchers with information and samples. EH&S met with all research groups initially, during the annual lab inspection, and additionally as needed. It was validated that researchers working with human subjects or patients had implemented the use of SESIP devices prior to this initiative, and sharps injuries among this group declined annually from 2004-2006. Researchers working with high-risk pathogens were required to implement SESIP devices by March 2006. In 2007, EH&S continued to assist researchers working with either non-human primates or BSL-2 agents to replace traditional sharps devices with SESIP devices. Assistance was provided by demonstrating SESIP devices, providing manufacturer information and samples, and identifying existing vendors who offer SESIP devices. These multifaceted initiatives proved key to ongoing implementation of the program.

Objectives

To apply OSHA Bloodborne Pathogen (BBP) standard to address all research groups at the University of Pittsburgh with high risk of exposure to bloodborne pathogens and other infectious agents, as well as highly hazardous chemicals, and to achieve implementation of safety-engineered sharps devices (SESIP)

Identification of Potential SESIP Users



Methods

Performed a Risk Assessment of the research community at the University.

- Determined biological and highly hazardous chemical agents of concern
•Identified the users of these agents
•Classified the context of the usage (e.g., in vivo or in vitro)
•Researched transmissibility, route of exposure, infectious dose, hazard, etc.

Identified user groups via:

- Institutional Review Board (IRB) database
•Semi-annual animal facility inspection program and annual lab inspection program
•Animal and recombinant DNA protocol review

Identified researchers with highest risk of exposure including the following:

- Clinical or human study subject settings
•High-risk pathogens (Risk Group 3, laboratories operating at BSL-3, ABLS-3, BSL-2+, ABLS-2+)
•Research with non-human primates and their blood/body fluids/tissues
•BSL-2 agents in a laboratory (including volunteer blood draws)
•Highly hazardous chemicals (ex. MPTP)
•Specialized animal facility personnel such as Veterinary Services and Surgical Research Facility staff

Staged a vendor fair with four vendors of safety-engineered sharps products and invited laboratory directors and contact personnel.

Methods

Followed up with laboratory directors and contact personnel on individual basis:

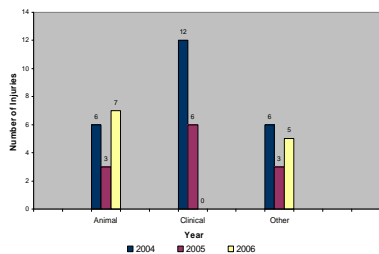
Questionnaire distributed to collect data on biological and chemical agents used, procedures performed, sharps devices utilized, and opportunities to implement safety-engineered sharps devices

Provided sample devices (retractable/shielded needles, shielded scalpels), product evaluation forms, and vendor information

Additional follow-up at predetermined time points and during annual lab inspections to collect results

Results

Total Sharps Injuries 2004-2006



Sharps injuries involving research with animals include any circumstance that happened within the time period of the preparation of injection in the animal to disposal of injection needle.

Sharps injuries that occurred in a clinical setting included blood draws, administration of agents to patients, or any other incident when in contact with a human subject.

The group termed "Other" includes Sharps injuries that are not involved with animals or human subjects. Examples include a laceration from razor blades while cutting gels, a needlestick from a needle that contained a chemical used for solvent bonding a tubing circuit, and a needlestick from reaching into a drawer that contained a clean needle.

Additional Sharps Injury Information on Focus Groups:

Table with 4 columns: Type of Sharps Injury, 2004, 2005, 2006. Rows include Non-Human Primate Research, BSL-2 or Above, and Total of All Sharps Injuries.

Results

User Groups

Table with 2 columns: Classification of Infectious Agent Usage and Number of Investigators or Facilities. Rows include Clinical patients and human study subjects, In vivo work assigned to ABLS-3, etc.

Results of meeting with user groups:

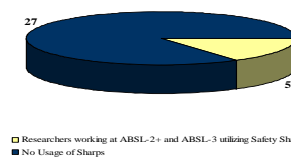
- All Clinical Researchers with human patient contact have already implemented safety-engineered sharps devices
•Researchers (17) working at ABLS-3 and ABLS-2+ and using sharps are required to use safety-engineered sharps devices wherever possible
•Few Researchers (3) using special equipment (i.e., glass micropipettes) to deliver recombinant lentivirus to animals and no safety-engineered sharps device are available for this particular procedure; safety-engineered sharps devices required for other procedures
•Researchers working at BSL-2 that use sharps in the laboratory with infectious agents are required to use safety-engineered sharps devices
•Researchers using highly hazardous chemicals such as MPTP are required to use safety-engineered sharps devices

1Studies conducted under protocols approved by the University's Human Subject Institutional Review Board.

2Researchers conducting a procedure where there is no safety alternative to the sharp being used must obtain approval of the procedure from the University's Biohazards Committee, University's Biosafety Officer, and Environmental Health and Safety Department.

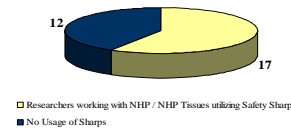
Results

Safety - Engineered Sharps Devices Usage (BSL-2+)



- Researchers (27) working at BSL-2+ do not use sharps with infectious agents
•Researchers (5) working at BSL-2+ and using sharps are required to use safety-engineered sharps where devices are available

Safety-Engineered Sharps Device Usage (NHP Research)



- Researchers working with non-human primates and/or non-human primate blood/tissues are required to use safety-engineered sharps devices

Conclusions

Conclusions:

Best work practice is to eliminate the use of sharps with infectious agents or highly hazardous chemicals

If sharps are used with infectious agents or highly hazardous chemicals, then safety-engineered sharps devices must be utilized

Accomplishments of Initiative:

Users of highly hazardous chemicals now required to use safety-engineered sharps

Surgical Research Facility, Veterinary Services and facilities housing primates order only safety-engineered sharps for blood draws, injections, etc

Exposure Control Plan updated annually with new safety-engineered sharps policies and procedures

Many employees made aware of safety-engineered sharps in 2005

Injuries decreased in 2005, then increased in 2006; University relies on self-reporting, so increased awareness may lead to higher rate of reporting

Moving Forward:

Additional data in the next few years will be required to ensure that implementing the Safety-Engineered Sharps Initiative is successful

Next user group required to implement the Initiative is ABLS-2 (March 1, 2009)