

Rice University
Exposure Control Plan



Environmental Health and Safety
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Exposure Control Plan

Rice University is committed to providing a safe and healthful work environment for all faculty students, staff and visitors. Rice University Policy 313 addresses the conduct of researcher in the laboratory and the following exposure control plan (ECP) is provided to eliminate or minimize occupational exposure to bloodborne pathogens in accordance with OSHA standard 29 *CFR* 1910.1030, "Occupational Exposure to Bloodborne Pathogens." This ECP includes:

- Determination of researcher's exposure
- Implementation of various methods of exposure control, including:
 - Universal precautions
 - Engineering and work practice controls
 - Personal protective equipment
 - Housekeeping
- Hepatitis B vaccination
- Post-exposure evaluation and follow-up
- Communication of hazards to the researcher and provide appropriate training
- Recordkeeping
- Procedures for evaluating circumstances surrounding exposure incidents

PROGRAM ADMINISTRATION

- Environmental Health and Safety (EHS) is responsible for implementation of the ECP. EHS will maintain, review, and update the ECP at least annually, and whenever necessary to include new or modified tasks and procedures.
- Those researchers who are determined to have occupational exposure to blood or other potentially infectious materials (OPIM) must comply with the procedures and work practices outlined in this ECP.
- The principal investigators and supervisors will provide and maintain all necessary personal protective equipment (PPE), engineering controls (e.g., sharps containers), labels, and biohazardous bags and other essential supplies.

- EHS will be responsible for training, documentation of training, and making the written ECP available to researchers, regulatory authorities.

EMPLOYEE EXPOSURE DETERMINATION

JOB CLASSIFICATION BY TITLE

The following list reflects positions in which researchers may have an occupational exposure to bloodborne pathogens and are considered “at risk” under the BBP Standard. This list should not be considered all inclusive.

Principal Investigator-Research Lab
Post Doctorate Fellow-Research Lab
Graduate Student-Research Lab
Undergraduate Student-Research Lab
Visiting researchers-Research Lab
Fellow-Research Lab
Safety Specialists
Emergency personnel-in the field

Exposure Tasks and Procedures

This list is not all inclusive however, it represents job duties which are performed by "at risk" individuals. If you perform any of these tasks you are considered "at risk" under the BBP Standard.

1. Collecting, analyzing, processing and testing human blood and/or other potentially infectious materials (OPIM)
2. Performing clinical, biochemical, cytochemical, immunocytochemical, or molecular procedures on human tissue or products
3. Conducting research using human blood and blood components, or preparing reagents from human blood or blood components
4. Conducting research using (OPIM) or preparing reagents from (OPIM)
5. Performing housekeeping duties in BSL2 laboratories
6. Handling laundry contaminated with human blood or other contaminated items
7. Handling and treating (e.g. autoclaving) waste prior to disposal
8. Performing preventative maintenance, repairs, or any service on equipment, devices, or plumbing in laboratories where human blood or (OPIM) is used

9. Handling or receiving human blood or (OPIM) samples
10. Handling and/or delivering packages containing human blood or (OPIM)
11. Performing compliance surveys in laboratories where human blood or (OPIM) is used or stored
12. Processing radioactive waste which may contain items contaminated with human blood or (OPIM)
13. Safety Specialist may be exposed while handling biological waste and/ or assisting lab personnel in conducting research in research laboratories.
14. EMS personnel, may come in contact with blood or OPIM during lifesaving efforts, or while rendering aid to injured persons.

Methods of implementation and Control

Universal Precautions

It is the policy of Rice University that all employees and students with an occupational exposure to bloodborne pathogens observe an approach to infection control known as Universal Precautions. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, or other bloodborne pathogens. This exposure control plan mandates observing Universal Precautions when contact with the following materials is reasonably anticipated:

Human blood, human blood components and blood products.

OSHA has listed the following as other potentially infectious materials (OPIM):

- Semen and vaginal secretions.
- Cerebrospinal fluid, synovial fluid, pleural fluid and pericardial fluid.
- Any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids.
- Any unfixed tissue or organ (other than intact skin) from a human (living or dead).
- HIV -containing cell or tissue cultures, organ cultures, and HIV or HBV containing culture media or other solutions.
- Blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Exposure Control Plan

Employees/students covered by the bloodborne pathogens standard receive an explanation of this ECP during their initial biosafety training session. It will also be reviewed in their annual refresher training. EHS is responsible for reviewing and updating the ECP as frequently as necessary to reflect any new or modified tasks and procedures that affect occupational exposure.

Engineering Controls and Work Practices

Engineering Controls and work practice controls shall be the primary means of eliminating or minimizing the researcher's exposure. Where occupational exposure remains after institution of these controls, personal protective equipment shall be used.

Engineering controls shall be examined and maintained or replaced on a regular schedule to ensure their effectiveness. Each department has a continuing responsibility to evaluate and set up other engineering controls which reduce exposure. Facilities Engineering and Planning should be contacted if any equipment is found to be malfunctioning.

Hand Washing Facilities

Hand washing facilities must be available and accessible to researchers and staff in BSL2 facilities.

1. Hands must be washed immediately or as soon as possible after the removal of gloves or other personal protective equipment.
2. Hands and any other skin must be thoroughly be washed with soap and running water, or flush mucous membranes with running water immediately or as soon as possible, following contact with blood or other potentially infectious materials.
3. Hands must be washed:
 - a. whenever there is visible contamination with blood or body fluids;
 - b. after completion of work;
 - c. after removing gloves and between glove changes;
 - d. before leaving the work area;
 - e. before eating, drinking, smoking, applying cosmetics or lip balm, changing contact lenses;
 - f. after using lavatory facilities

Sharp Disposal

Any object, which is contaminated with blood or OPIM and is capable of penetrating the skin, is considered a contaminated sharp. Needle sticks are an efficient means of transmitting bloodborne diseases. Because of their high potential for transmitting bloodborne pathogens to the research and the general public, contaminated sharps should be handled as follows:

1. Contaminated needles and other contaminated sharps shall not be bent, recapped, or removed except as follows: the researcher must demonstrate that no alternative is feasible or that such action is required by a specific procedure, and such recapping or needle removal must be accomplished by a mechanical device or a one-handed technique.
2. Shearing and breaking of contaminated needles is **PROHIBITED**.
3. All contaminated reusable sharps shall be managed as follows:
 - a. Immediately, or soon as possible after use, sharps shall be placed in appropriate containers until properly processed.
 - b. Containers shall be puncture resistant, labeled with biohazard sticker, leak proof on sides and bottom, and shall not be stored or processed in a manner that requires anyone to reach by hand into the containers.
4. All contaminated sharps to be discarded shall be managed as follows:
 - a. Immediately, or as soon as possible after use, sharps shall be discarded in containers that are closable, puncture resistant, leak proof on sides and bottom, and labeled with a biohazard symbol.
 - b. Sharps containers shall be easily accessible and located as close as possible to the area where sharps can be reasonably anticipated to be found, e.g., laboratories.
 - c. Containers must be maintained upright, replaced routinely and not allowed to overfill.
 - d. When removing containers of contaminated sharps from the area of use, the container shall be closed immediately and placed in a secondary container. The secondary container shall be closable and constructed to contain all contents during handling, storage, transport, or shipping.
 - e. All sharps containers generated at Rice are autoclaved and disposed of by a commercial vendor. Sharps containers are available in the Environmental Safety Office.
5. General Safety Practices
 - a. Food and drink shall not be kept in refrigerators, freezers, cabinets, shelves, or on countertops or bench tops where blood or other potentially infectious materials are present.
 - b. The rule prohibiting eating, drinking, applying cosmetics or lip balm, and handling contact lenses in laboratories includes all work areas where there is a "reasonable" likelihood of occupational exposure.

Containers for blood and other potentially infectious materials

1. Specimens of blood or other potentially infectious materials must be placed in a container that prevents leakage during collection, handling, processing, storage, transport, or shipping.
2. Specimen vials, sealed cups, and large leak-resistant containers are placed into appropriate sized, translucent plastic bags for secondary containment.
3. If outside contamination of the primary container occurs, the primary container must be placed within a second container which prevents leakage during handling, processing, storage, transport or shipping and is labeled or color-coded in accordance with the requirements of the Standard.
4. Individual containers of blood or other potentially infectious materials that are placed in a labeled container during storage, transport, shipment or disposal are exempt for the labeling requirements.

Contaminated Equipment

1. All equipment which may become contaminated with blood or other potentially infectious materials shall be inspected prior to servicing or shipping and shall be decontaminated as necessary, unless the researcher demonstrates to the EHS that decontamination of such equipment or portions of such equipment is not feasible.
2. A readily observable label must state which portion of the equipment is still contaminated. All service representatives and/or manufacturers shall be given this information prior to handling, servicing, or shipping in order that appropriate precautions may be taken.

Personal Protective Equipment (PPE)

PPE is must be provide to all personnel. Training in the use of the appropriate PPE for specific tasks or procedures is provided by EHS as well as the principal investigator and/or supervisor.

Guidelines for selecting personal protective equipment

Each department or laboratory shall determine appropriate types of PPE necessary to provide barrier protection for their students and researchers. The protective equipment utilized is simply to be chosen to protect against contact with blood or other potentially infectious materials with regard to the task being performed. Unnecessary and overuse of personal protective equipment should be avoided.

Exemptions for the use of personal protective equipment (PPE)

The Standard allows an exemption to the use of personal protective equipment temporarily and briefly under rare and extraordinary circumstances which are unexpected and threaten the life or safety of a worker, or co-worker. OSHA does not consider discomfort a legitimate reason to disregard the use of appropriate personal protective equipment.

Training and surveillance for personal protective equipment (PPE)

1. Training in the appropriate selection and use of PPE will be initiated as new researchers enter the laboratory and reinforced by the laboratory supervisor.
2. Surveillance for inappropriate use of PPE should be conducted on an ongoing basis. Additional surveillance will be conducted through methods including, but not limited to, routine monitoring of compliance, lab audits, and inspections along with a review of Rice incident reports.
3. Inappropriate technique and use of PPE will be investigated and corrected by the supervisor, and when necessary, the laboratory safety representative. Repeated offenses will be reported to the PI as outlined in the Laboratory Policy 313.

Gloves

1. Gloves must be worn when it can be reasonably anticipated that the students or researcher may have hand contact with blood, other potentially infectious materials, mucous membranes, and non-intact skin; when handling or touching contaminated items or surfaces; and when performing vascular access procedures.
2. Disposable (single use) gloves such as surgical or examination gloves must be replaced as soon as practical when contaminated if they are torn, punctured, or if their ability to function as a barrier is compromised. Disposable (single use) gloves must not be washed or decontaminated for reuse.
3. Utility gloves may be decontaminated for reuse if the integrity of the glove is not compromised. However, they must be discarded if they are cracked, peeling, torn, punctured, or exhibits other signs of deterioration or when their ability to function as a barrier is compromised.

Masks, eye protection, and face shields

Masks in combination with eye protection devices, such as goggles or face shields, must be worn whenever splashes, sprays, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated.

Laboratory Coats and other protective body clothing

Laboratory coats or other protective gowns or may be made of cloth or of disposable fluid resistant material depending on the degree and type of contamination, which is anticipated. Protective clothing items should be long-sleeved and kept buttoned or fastened at all times to maximize protection of exposed skin and clothes.

All protective clothing items shall be removed before leaving the laboratory or work area. Contaminated or soiled gowns or coats may not be worn in public areas. Public areas include, but are not limited to, break rooms, lounges, eating areas, storage areas, and rest rooms. Protective clothing shall be changed immediately, or as soon as possible, after becoming visibly contaminated with blood or body fluids.

Contaminated gowns or coats shall be laundered or disposed of according to department procedures. Protective clothing should not be taken home to be washed or discarded.

Housekeeping

Laboratory and research work areas must be maintained in a clean and sanitary condition. The term "work area" refers to areas which have a reasonable possibility of becoming contaminated with blood or other potentially infectious materials.

1. All equipment, environmental and working surfaces shall be cleaned and decontaminated after contact with blood or other potentially infectious materials. The housekeeping staff must not be asked to clean up spills involving bloodborne pathogens or other infectious materials.
2. Decontaminate immediately or as soon as possible when surfaces are overtly contaminated or after the spill of blood or other potentially infectious materials.
3. Decontaminate at the end of the work day if the surfaces may have become contaminated since the last cleaning.
4. Protective coverings, such as plastic wrap, aluminum foil, or imperviously-backed absorbent paper used to cover equipment and environmental surfaces, shall be removed and replaced as soon as possible when they become overtly contaminated.
5. Broken glassware which may be contaminated shall not be picked up directly by hand. It shall be cleaned up using mechanical means such as brush and dust pan, tongs, or forceps.

Biohazardous waste is placed in containers which are closable, constructed to contain all contents and prevent leakage, appropriately labeled or color-coded (see the following section "Labels"), and closed prior to removal to prevent spillage or protrusion of contents during handling. Biohazard boxes are available in George R. Brown, BRC or by contacting the Environmental Safety Department.

Contaminated sharps are discarded immediately or as soon as possible in containers that are closable, puncture-resistant, leak proof on sides and bottoms, and appropriately labeled or color-coded. Contaminated sharps containers should be placed in Biohazard disposal boxes for final disposal.

Laundry

Lab Coats should be laundered by a commercial company experienced in handling contaminated laundry. The cost of this service is at the expense of the PI or supervisor. For details on the current vendor contact EHS.

Labels

Rice University requires that all laboratories which use blood or OPIM must have a biohazard symbol on the door on the sign created using the EHS sign generator. In addition the biohazard symbol must be affixed to any regulated waste, places where blood or OPIM are stored e.g. refrigerators, or equipment that is contaminated with blood or OPIM e.g. centrifuges.

The PI, supervisor, or their designee is responsible for ensuring that warning labels are affixed or biohazard bags are used as required if regulated waste or contaminated equipment is brought into the facility.

HEPATITIS B VACCINATION

EHS will provide training to researchers and students on hepatitis B vaccinations, addressing safety, benefits, efficacy, methods of administration, and availability. Vaccination is encouraged unless: 1) documentation exists that the researcher has previously received the series; 2) antibody testing reveals that the researcher is immune; or 3) medical evaluation shows that vaccination is contraindicated. However, if a researcher declines the vaccination, a declination form must be signed and submitted to EHS. Documentation of refusal of the vaccination is kept at EHS main office. Vaccination will be provided by NOVA clinic or current contractor of the university. The researcher may also go to the doctor of their choice.

POST-EXPOSURE EVALUATION AND FOLLOW-UP

Should an exposure incident occur, contact Rice EMS at the following number 713-348-6000. Following initial first aid (clean the wound, flush eyes or other mucous membrane, etc.). Complete a first report of injury form found on the EHS web site. If referred to a physician contact the Risk Manager for post follow-up information.

PROCEDURES FOR EVALUATING THE CIRCUMSTANCES

SURROUNDING AN EXPOSURE INCIDENT

EHS will review the circumstances of all exposure incidents to determine:

- engineering controls in use at the time
- work practices followed
- a description of the device being used (including type and brand)
- protective equipment or clothing that was used at the time of the exposure incident (gloves, eye shields, etc.)
- location of the incident
- procedure being performed when the incident occurred
- EHS will document all activities.

If revisions to this ECP are necessary EHS will ensure that appropriate changes are made.

BIOSAFETY TRAINING

All researchers who have occupational exposure to bloodborne pathogens receive initial and annual training conducted by EHS. It is the researcher's responsibility to sign up and complete training. A schedule of training courses is posted on the EHS web site. The training program covers, at a minimum, the following elements:

- a copy and explanation of the OSHA bloodborne pathogen standard
- an explanation of our ECP and how to obtain a copy
- an explanation of methods to recognize tasks and other activities that may involve exposure to blood and OPIM, including what constitutes an exposure incident
- an explanation of the use and limitations of engineering controls, work practices, and PPE
- an explanation of the types, uses, location, removal, handling, decontamination, and disposal of PPE
- an explanation of the basis for PPE selection
- information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine will be offered free of charge

- information on the appropriate actions to take and persons to contact in an emergency involving blood or OPIM
- an explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available
- information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee/student following an exposure incident
- an explanation of the signs and labels and/or color coding required by the standard and used at this facility
- an opportunity for interactive questions and answers with the person conducting the training session.

RECORDKEEPING

Training Records

Training records are completed for each faculty, staff, student and researchers upon completion of training. These documents will be kept for at least three years and can be referenced through the EHS web site.

Medical Records

Medical records are to be maintained for by the physician of the researcher or the researcher themselves. Copies of the records must be obtained by the individual and the EHS office.

Sharps Injury Log

All incidences must include at least:

- date of the injury
- type and brand of the device involved (syringe, needle)
- department or work area where the incident occurred
- explanation of how the incident occurred.

This information should be submitted on the Accident/ Injury report form found on the EHS website: safety.rice.edu