

# Bloodborne Pathogens

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## University of Tennessee Safety Program HM-010

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### Purpose

The purpose of this written program is to provide a framework for minimizing or eliminating occupational exposure to bloodborne pathogens, in accordance with OSHA standard 29 CFR 1910.1930.

### Scope and Applicability

This shall apply to individuals on campus who have the potential to encounter potentially infectious bloodborne pathogens as a part of their job responsibilities, with worker health protection and compliance with OSHA regulations in mind.

This shall apply to all students, staff and faculty on the Knoxville campus of the University of Tennessee, who work in non-research settings. Individuals who work in a research setting are covered under the Bloodborne Pathogens Policy issued by the Office of Biosafety, under the Office of Research.

### Abbreviations and Definitions

#### Abbreviations

**BBP:** Bloodborne Pathogens

**EHS:** Environmental Health and Safety

**HBV:** Hepatitis B virus

**HCV:** Hepatitis C virus

**HIV:** Human immunodeficiency virus OPIM – Other potentially infectious materials

**OSHA:** Occupational Safety and Health Administration PPE – Personal protective equipment

#### Definitions

**Biohazardous sharp:** Any device that is sharp enough to puncture the skin and that is contaminated with any biologically active specimen material or biological culture material (examples include: needles, lancets, scalpels and broken glass).

**Bloodborne pathogens (BBP):** pathogenic microorganisms that are present in human blood or other body fluids and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV). BBP are transmitted through contact with infected human blood and other body fluids such as trauma fluids (synovial fluid, pleural fluid, cerebrospinal fluid, amniotic fluid, etc), semen, etc., and can also be transmitted through the mucous membranes of the eye, nose and mouth, and through any damaged or broken skin (i.e. cuts, scrapes, rashes, acne).

**Contaminated:** presence, or the reasonably anticipated presence, of blood, or other potentially infectious materials on any item or surface

**Occupational exposure:** reasonably anticipated (includes the potential for contact as well as actual contact with blood or OPIM) skin, eye, mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

**Other potentially infectious materials (OPIM):** Materials in addition to human blood that may be capable of transmitting bloodborne pathogens. These include:

- The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental settings, 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.
- Human cell/tissue/organ cultures not shown to be free of bloodborne pathogens.
- Blood, organs, or other tissues from experimental animals infected with human bloodborne pathogens.

**Personal protective equipment (PPE):** specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g. uniforms, pants, shirts, blouses) not intended to function as protection against a hazard are not considered personal protective equipment.

**Regulated biohazardous waste:** includes any liquid or semi-liquid blood or other potentially infectious materials; contaminated items that could release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed, and/or items that are caked with dried blood or other potentially infectious materials.

**Universal precautions:** approach to infection control that assumes all bodily fluids are potentially infectious materials.

**Work practice controls:** controls that reduce the likelihood of exposure by altering the manner in which a task is performed.

## Roles and Responsibilities

This section briefly describes the function of each group and its role in ensuring compliance with the University's Bloodborne Pathogens Program

### University Administration

The Chancellor of the University is responsible for the administration of this program pertaining to institutional safety and health-related matters. The Chancellor oversees the administration of safety policies through the chain of authority within the institution, delegating to deans, department heads, principal investigators and supervisors the responsibility for ensuring safe work practices of those under their supervision and adherence to established policies, programs and guidelines.

### EHS

EHS is responsible for supporting non-research departments' compliance with this program. Note that

employees who work in a research settings must follow the Bloodborne Pathogens Exposure Control Plan that is written and enforced by the Office of Biosafety.

Specific duties of the EHS include:

- Revise this program on an annual basis.
- Design and improve disposal procedures for biological waste generated in non-research departments.
- Schedule and co-ordinate the activities of the biohazardous waste contractors on campus.
- Provide BBP training for all non-research departments upon request.

### **Supervisors**

The classroom instructor or supervisor has the direct responsibility for assuring that this program established herein are followed by all personnel under their jurisdiction, and that they have an Exposure Control Plan in place that is readily accessible to their employees and students.

### **Affected Employees**

The individual employees are expected to:

- Package, label and dispose of all biological waste in accordance with established procedures set forth in this program.
- Follow the guidelines set in this program document when encountering situations in which a potential exists for BBP exposure and understanding which tasks have potential occupational exposure to bloodborne pathogens.
- Report to their supervisor all possible occupational exposure incidents.
- Seek the advice, when necessary, of EHS concerning the proper handling and disposal of biological materials.
- Attend the bloodborne pathogens initial training session and annual retraining sessions.
- Develop and maintain good personal hygiene habits.

### **Procedures**

This program covers an individual's potential exposure to a regulated BBP waste, which includes:

- Any liquid or semi-liquid blood or other potentially infectious materials (OPIM).
- Contaminated items that would release blood or OPIM in a liquid or semi-liquid state if compressed.
- Items that are caked with dried blood or OPIM.

A BBP occupational exposure incident occurs when human blood or other bodily fluids enters the bloodstream through:

- Splash to the eyes, nose, or mouth
- Puncture wound with contaminated item
- Contact with broken skin

### **Work Practice Controls**

Work practice controls should be in place so that individuals can minimize their exposure to BBP.

### **General Guidelines**

- Individuals working in a potentially exposed area where there is a likelihood of exposure, should never eat, drink, smoke, apply cosmetics or lip balm, or handle contact lenses. Do not keep food or drink in refrigerators, freezers, shelves, cabinets, or on counter tops where human blood or OPIM are present.
- Hand washing is one of the most important (and easiest) practices used to prevent transmission of BBP. An employee should use soap to wash hands, or other exposed skin thoroughly as soon as possible following an exposure. All employees should be familiar with the location of the nearest hand washing facilities. Laboratory sinks, public restrooms, janitor closets, and so forth may be used for hand washing if they are normally supplied with soap. An alcohol-based hand rub may be used in areas without hand washing facilities. If these alternative methods are used, hands should be washed with soap and running water as soon as feasible.
- Employees who have routine exposure to bloodborne pathogens (such as doctors, nurses, first aid responders, etc) shall be offered the Hepatitis B vaccine series at no cost to them unless: they have previously received the vaccine series; antibody testing has revealed they are immune, or the vaccine is contraindicated for medical reasons. The vaccine is a series of three shots, which gradually builds the body's immunity to the Hepatitis B virus. The vaccine must be administered within 10 days of job assignment.
- Employers should create a schedule for periodic cleaning and appropriate disinfecting to ensure the workplace is kept clean and sanitary.
- Contaminated laundry should be placed and transported in properly labeled biohazard or color-coded bags and containers.

### ***Sharps Management***

Needles: The following universal precautions should be used when encountering used needles:

- Needles or other sharps should not be bent, recapped, or moved except by using a mechanical device or tool such as forceps, pliers, or broom and dust pan.
- Needles should never be broken or sheared.
- Needles shall be disposed of in labeled sharps containers only.
- Sharps containers shall be closable, puncture-resistant, leak-proof on sides and bottom, and/or must be labeled or color-coded.
- When sharps containers are being moved from the area of use, the containers should be closed immediately before removal or replacement to prevent spillage or protrusion of contents during handling or transport.
- Sharps containers must be removed from service when they are two-thirds full.

### **Broken Glassware**

- Broken glassware that has been visibly contaminated with blood or OPIM must be sterilized with an approved disinfectant solution before it is disturbed or cleaned up. Broken glassware should not be touched by hand. Sweep or brush the material into a dustpan.
- Glassware that has been decontaminated may be disposed of in an appropriate sharps container: (i.e. closable, puncture-resistant, leak-proof on sides and bottom, with appropriate biohazard labels).
- Uncontaminated broken glassware may be disposed of in a closable, puncture-resistant container such as a cardboard box or coffee can.

### **Personal Protective Equipment**

Personal Protective Equipment (PPE) must be chosen based on the level of protection required for the expected exposure. PPE may include gloves, gowns, lab coats, face shields, masks, eye protection and other gear. The PPE must be readily accessible to the individuals and in appropriate sizes. All PPE must be removed prior to leaving the work area.

### **Gloves**

- Disposable gloves should be worn whenever it is anticipated that an individual will have hand contact with blood or OPIM, and when handling and touching contaminated surfaces. All gloves should be removed prior to leaving the work area, or if they are torn or punctured. Hands should be washed after removing gloves.
- Gloves should be made of nitrile, rubber, or other water impervious materials. Gloves should always be inspected before each use.
- Double gloving can provide an additional layer of protection.
- If you have cuts or sores on your hands, you should cover these with a bandage or similar protection as an additional precaution before donning gloves. Don't touch the outside of used gloves.

### **Goggles, Face Shields, and Aprons:**

- Goggles should be in use if there is a risk of splashing or vaporization of contaminated fluids.
- Face shields provide additional protection for the nose and mouth.
- Aprons and lab coats protect against splash hazards.

PPE should be removed before leaving the work area, or when the PPE becomes contaminated. If a garment becomes penetrated, workers must remove the garment as soon as possible, and it should be disposed on a designated biohazardous container.

### **Engineering Controls:**

Engineering Controls include equipment such as hand washing facilities, eye wash stations, sharps disposal containers, biological safety cabinets, autoclaves, and sharps safety devices are to be used when appropriate. Examples of sharps safety devices include needleless systems and sharps with engineered sharps injury protection (e.g. self-sheathing needle or syringes). Engineering controls must be examined and maintained or replaced on a regular schedule to ensure their effectiveness.

### **Decontamination:**

All surfaces, tools, equipment and other objects that come in contact with blood or OPIM must be decontaminated and sterilized as soon as possible. Equipment and tools must be cleaned and decontaminated before servicing or being put back to use.

Types of disinfecting solutions include a solution of 5.25% sodium hypochlorite (household bleach) diluted between 1:10 and 1:100 with water. The standard recommendation is to use at least a quarter cup of bleach per one gallon of water. In addition, Lysol or some other EPA-registered disinfectant certified to be effective against HIV-1 and hepatitis B virus may be used. Check the label of all disinfectants to make sure they meet this requirement.

When cleaning up a contaminated area carefully cover the area with paper towels or rags; gently pour a 10% solution of bleach over the towels or rags; let the disinfectant sit for 10 minutes, then wear gloves to collect & dispose of waste. When cleaning up a blood spill, carefully cover the spill with paper towels or rags, then gently pour your 10% solution of bleach over the towels or rags, and leave it for at least 10 minutes. This will help

ensure that the BBP are killed before the actual cleaning begins or wiping the material up. By covering the spill with paper towels or rags, the chances of causing a splash when pouring the bleach are decreased.

When decontaminating equipment or other objects (e.g. scalpels, microscope slides, broken glass, saw blades, tweezers, mechanical equipment upon which someone has been cut, first aid boxes) leave the disinfectant in place for at least 10 minutes before continuing the cleaning process.

Any materials used to clean up a spill of blood or OPIM must be decontaminated or managed as a biohazard immediately, as well. This would include mops, sponges, re-usable gloves, buckets, pails, etc.

### Signs and Labeling:

In order to comply with OSHA regulations and University requirements, the following information must appear on any items containing biohazard material or waste:

Warning labels must be placed on containers of regulated waste, refrigerators and freezers containing blood or OPIM; and other containers used to store, transport, or ship blood or other potentially infectious materials. Employees should be observant of these signs and ensure they are using proper precautions when working, cleaning, etc. in areas posted with these signs.



### Disposal of Biohazardous Waste:

When disposing of contaminated biological waste:

- Discard in a biohazard bag placed inside a secondary biohazard waste container.
- Locate containers for regulated waste so they are readily accessible to individuals and as close as possible to the source of the waste.
- Maintain waste containers in an upright position and do not overfill.
- Close containers when not actively in use and at the end of the day.
- Ensure the outside of the biohazard container is not contaminated. Disinfect the outside of the storage container as a secondary precaution.
- Contain and store waste in accordance with procedures outlined by the medical waste contractor when applicable.
- Sharps should be disposed of in red labeled containers. The picture below illustrates an example of a sharps container.



### Emergency Situations

In emergency situations where an individual might be exposed to BBP, always use universal precautions to minimize exposure, which may include gloves, splash goggles, pocket mouth-to-mouth resuscitation masks, and other barrier devices.



If an individual is exposed, the affected person should take the following steps:

- Wash the exposed area thoroughly with non-abrasive antibacterial soap and running water.
- Flush mouth, nose, and eyes for 15 minutes if blood splashed in these areas.
- Remove clothes that are contaminated with blood as soon as possible and use universal precautions when handling contaminated clothing. Place contaminated items in approved and labeled bags and containers, then dispose of as biohazardous waste.
- Report the exposure to your supervisor, and complete an exposure report form. It is very important to report exposure incidents as soon as possible to give the best chance to forestall bloodborne pathogen infections, and to prevent the spread of the bloodborne infection to others. Furthermore, it enables the exposed employee to evaluate the circumstances surrounding the exposure and find ways to prevent the situation from occurring again. This form will be kept in the person's file for 40 years to document workplace exposures to hazardous substances. This report is available from the supervisor or from EHS.
- The exposed employee may go to the Occupational Health Department at UT Medical Center (or the UT Emergency Room after normal business hours) to request blood testing or the HBV vaccination if not already immunized. Exposed students may go to the Student Health Center on campus for treatment and testing.

If one or more individuals must treat an injured employee, here are some guidelines that can be taken to minimize their exposure to BBP:

- Have disposable gloves (in appropriate size) readily available at all times. Wear two pair of gloves for all spill response activities.
- If a spill occurs, isolate the contaminated area immediately. Either post someone at the site to keep others out of the area, or close off the area.
- Other than very minor spills involving a few drops of blood, all spill response procedures should be carried out with two trained persons present if at all possible. If the spill is too large for a single person to manage with the supplies available or if the individual is not confident that he/she can manage the spill on their own, the supervisor must be notified and request additional assistance.
- If the spill includes contaminated broken glass, use mechanical tools to pick up the broken glass. Contaminated broken glass should be placed in a sharps container for disposal if feasible. If this is not feasible, place broken glass in a puncture-resistant bucket. Permanently close the bucket with a lid and place the bucket into a biohazardous waste bag. Blood spill response waste must be disposed of as medical waste. While awaiting disposal, bags of spill waste must be stored in a secure area in a leak-proof container with a lid that is labeled as a biohazard.
- If clothes become contaminated with blood or OPIM, remove the contaminated clothing items as soon as possible. If the contamination soaked through to the skin, thoroughly flush the exposed skin. (See exposure incident response procedure at the end of this guidance document.) Moderately or heavily contaminated clothing should be laundered on-site separate from other clothing using hot water and a bleach-based detergent. Alternatively, this clothing may be sent to a commercial laundry service that is equipped to process clothing contaminated with blood or OPIM. Contaminated clothing awaiting treatment must be stored in a closed leak-resistant plastic bag tagged with a biohazard symbol. The clothing may also be disposed of as bio-hazardous waste.
- Always wash your hands after glove removal or anytime they may have come into contact with body fluid contamination.

## Post Exposure Follow-up

An individual who is involved in an exposure incident will be provided a post exposure follow up, which includes laboratory tests; providing confidential medical evaluation, identifying, and testing the source individual, if feasible; testing the exposed employee's blood, and, with consent of the employee, performing post-exposure prophylaxis; offering counseling; and evaluating reported illnesses. All diagnoses will remain confidential.

## Exposure Control Plan:

OSHA requires that each work place develop and maintain an Exposure Control Plan that is specific to a department. Copies of the exposure plan should be kept in a place readily accessible by all employees. The exposure control plan lists and defines training of affected employees, documentation of exposure, PPE, and other pertinent information specific to that department.

## Recordkeeping

Records shall be maintained as follows

### Training

- OSHA BBP - initial and annual refresher training.

### Communiqués from and to:

- Regulatory agencies
- Biological disposal vendors
- Generators of biohazard waste (non-research setting)
- University administration

These records will be kept by EHS.

## Sharps Injury Log

### Employee Medical Records

- Employers must maintain employee medical records.
- These will be kept by Occupational Health and by the department to an extent.

Most of these records must be maintained for three years to meet regulatory requirements. However, to be prudent these records will be kept indefinitely.

Training records and medical records shall be maintained by the individual department to whom the employee or student reports. Training records for employees may also be kept in IRIS. Medical records must be maintained for the duration of the employment plus 30 years in accordance with OSHA's standard on medical records.

## Training and Information

Supervisors and department heads must ensure that their workers, who have the potential for BBP exposure in their daily duties, receive regular training that covers the dangers of bloodborne pathogens, preventive practices and post-exposure procedures. Departments must offer this training on initial assignment, then at least annually.



**Initial training should cover the following topics:**

- OSHA's Bloodborne Pathogens Standard and UTK's Exposure Control Plan
- Epidemiology, symptoms and modes of transmission of bloodborne diseases including HIV, HBV and HCV; existence of other blood borne diseases;
- Methods for recognizing tasks and other activities that may involve exposure to blood and OPIM;
- Review of use and limitations of methods that will prevent or reduce exposure, including:
- Engineering controls
- Work practice controls
- Personal protective equipment (PPE);
- Proper selection, use and disposal of PPE;
- Visual warning of biohazards including labels, signs and color-coded containers;
- Information on the HBV vaccine, including its availability, efficacy, safety, benefits, administration, and HBV Vaccination Program;
- Emergency actions for incidents involving blood or OPIM;
- Incident reporting and post-exposure follow-up procedures;
- Post-exposure evaluation and follow-up including medical consultation.

EHS offers general training. The departments are required to offer site-specific training.

**References**

OSHA 29 CFR 1910.1030 (Bloodborne Pathogens Standard)

Tennessee Code Annotated 50-3-203(e)(1)-(e)(4) and Tennessee Rule 0800-1-10

**Appendices**

Appendix A: Bloodborne Pathogen Exposure/Sharps Injury Report

**Disclaimer**

The information provided in these guidelines is designed for educational use only and is not a substitute for specific training or experience.

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**Appendix A:**  
**University of Tennessee Knoxville**  
**Bloodborne Pathogen Exposure/Sharps Injury Report**

Date of the Incident: \_\_\_\_\_ Time of the Incident: \_\_\_\_\_

Department: \_\_\_\_\_ Supervisor: \_\_\_\_\_

Job Title of Exposed Employee: \_\_\_\_\_

Description of task being performed when exposure occurred: \_\_\_\_\_

Was the State of Tennessee Accident Report form completed and submitted for this incident? If NO, state why.

What was the route of exposure? \_\_\_\_\_

What engineering controls were in use at the time of the incident? \_\_\_\_\_

What work practices were in use at the time of the incident? \_\_\_\_\_

What PPE was in use at the time of the incident? \_\_\_\_\_

**Sharps Injury Information**

Did the injury involve a sharp device?      YES    NO

*(If yes, please answer the following questions below).*

What part of the body sustained the sharps injury? (Be Specific) \_\_\_\_\_

Was the device visibly contaminated with blood or OPIM? \_\_\_\_\_

Describe the nature of the injury (i.e. scratch, puncture with visible blood, etc.): \_\_\_\_\_

Describe the sharp device that caused the injury (Include name/purpose of device, brand, model number, needle gauge): \_\_\_\_\_

Was the device a “safe sharps device”?      YES    NO

