Introduction

Welcome to the **Bloodborne Pathogens (BBP) Training Course (OHS_BIO500)**. UAB Campus Employees whose job duties put them at increased risk for exposure to bloodborne pathogens are required to complete this course. Anyone that comes in contact with human blood, body fluids, or Other Potentially Infectious Material (OPIM) is at risk!

This course is designed to train UAB campus employees on the principles and requirements of the OSHA BBP Standard. If you are not a UAB campus employee, training that is more thorough may be needed, particularly regarding your reporting and exposure-response procedures, which will differ from those outlined herein. If you have any questions, call UAB's Department of Occupational Health and Safety (OH&S) at (205) 934-2487.

Objectives

At the conclusion of this course, participants will be able to:

1. Recognize the hazards of aerosol-generating procedures.
2. Identify potential sources and risks of Bloodborne Pathogens Standard (BBP) in their work area.
3. Implement containment controls to mitigate the risk of Bloodborne Pathogen exposure.
4. Apply the precautions outlined in the Bloodborne Pathogens Standard.
5. Apply the correct response procedures and treatment plan if exposure occurs.

The Bloodborne Pathogens Standard

The **OSHA Bloodborne Pathogens Standard** was established to minimize occupational exposure to Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and other pathogenic microorganisms that are present in human blood and can cause disease in humans. The UAB Biosafety Manual contains additional information if needed.

Regulatory Definitions (per OSHA Bloodborne Pathogens Standard)

Contamination

Contamination refers to anything soiled with human blood, OPIM, or BBP's.

Decontamination

Decontamination refers to making surfaces and equipment safe for being handled or used, and disposed of by removing, inactivating, and destroying the infectious material.

Other Potentially Infectious Materials (OPIM)

OPIM are any other fluids that could be potentially contaminated. OPIM includes:

- Unfixed human tissue or organs
- Cells, tissues, or organ cultures containing HIV, HBV, or HCV
- Culture medium containing HIV, HBV, or HCV
- Animal specimens (such as blood and organs) with HIV, HBV, HCV, or other BBP
- Untested human body fluids that potentially contain blood

Other examples: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, and amniotic fluid.

Primary Containment

Primary Containment refers to engineering controls (e.g., BSC, sharps containers, and centrifuge safety cups) acting as a primary barrier limiting the infectivity of a pathogen for specific hosts, or its dissemination and survival in the environment.

Universal Precautions

Universal Precautions is the premise that all human blood, blood products, and body fluids are affected by BBP contamination. You should always handle materials using the appropriate controls and precautions.

Four Key Elements

Exposure Control Plan (ECP)

An ECP is a site-specific risk assessment conducted by a Principal Investigator (PI) or other Designee designed to identify and reduce the risk of BBP exposures. It must be reviewed and updated at least annually by the PI or Designee, or earlier if significant changes in personnel or procedures occur. The purpose of an Exposure Control Plan (ECP) is to:

1. Identify materials or processes in the workplace that pose an increased risk for exposures to BBP (i.e., human blood or OPIM).
2. Determine which jobs/duties place employees at risk for exposure to BBP.
3. Define the controls required to reduce those risks.

Each laboratory working with material of human origin must include an ECP in their Safety Manual. This manual **must be** available to **all employees** determined to be at risk for occupational exposure to human BBP.

For more information, see the **Risk Assessment Matrix.**

Determination of Employee Exposure

An evaluation must be made to determine if an employee's duties place them at an increased risk for a BBP exposure. Once an employee's exposure risk has been identified, exposure controls should be implemented to mitigate risk. Controls to reduce risk may include administrative practices, engineering controls, and personal protective equipment.

The Laboratory Supervisor or the designated Safety Officer will identify the materials, procedures, and job duties that pose an occupational exposure risk to BBP.

Job Classifications

Employees working in the following job classifications are likely to be at risk for occupational exposure to Bloodborne Pathogens. **This list is by no means exhaustive**.

- Medical Research Personnel
- Healthcare Workers
- Physicians
- Clinical Lab Workers

- Campus Police Workers
- Fire and Rescue Personnel
- Environmental Services Personnel
- Occupational Health and Safety Staff

Routes of Exposure

The occupational exposure may occur in the following:

1. Inhalation (infectious aerosols)
2. Absorption (skin or mucous membrane contact)
3. Ingestion (eating)
4. Injection (skin puncture)

Vaccinations and Post-exposure Follow-Up Procedures

HBV Vaccination Program

The PI/Manager will ensure that all persons determined to be at risk for occupational exposure to human Bloodborne Pathogens are offered a Hepatitis B Vaccination within ten days of starting work. **The PI or department must maintain documentation of HBV participation or declination**.

Medical records are confidential and are to be maintained by the UAB Occupational Medicine Program or healthcare provider for at least 30 years post-employment.

Exposure/Injury-Response Procedures

Prompt medical attention may reduce the risk of serious health consequences after an exposure event.

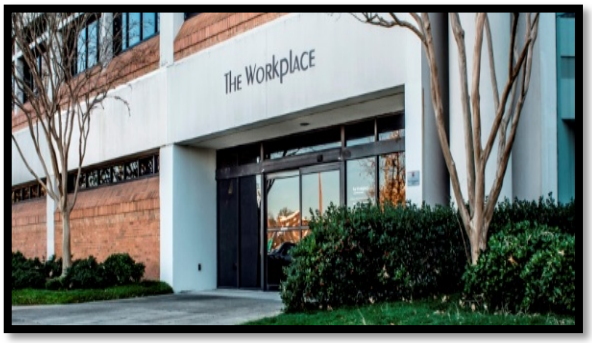
Have you been exposed to human blood or OPIM? You should:

- Wash affected areas with soap and water for 15 minutes
- Flush mucous membranes with water for 15 minutes
- Notify your Supervisor/Manager as soon as possible
- **Campus employees** (not hospital/medical care associated exposures):
    - You are required to report any exposure or injury to a Supervisor, PI, or Manager. The PI/Manager is also responsible for reporting the incident to UAB Occupational Health & Safety at (205) 934-2487. OH&S will investigate the circumstances surrounding the exposure,

and work with the PI/Manager to modify work practices or develop additional prevention strategies.

- A completed **Initial Medical Evaluation Authorization Form**, signed by a Manager or Supervisor, should accompany any employees seeking treatment.
- If the exposure occurs during course and scope of your employment activities, you should go to The Workplace Clinic, within UAB Highlands, between 7am-4pm during weekdays). Outside of these hours, or on weekends, campus employees should go to UAB Urgent Care, University Hospital Emergency Department (UED), or Highland ED.

- **Students**:
  - You are required to report any exposure or injury to a Supervisor, PI, or Manager. The PI/Manager is also responsible for reporting the incident to UAB Occupational Health & Safety at (205) 934-2487. OH&S will investigate the circumstances surrounding the exposure, and work with the PI/Manager to modify work practices or develop additional prevention strategies.



  - **Non-Emergencies (class-related)**: Students seeking non-emergency medical attention for exposures or injuries that occur in the course of their academic curriculum should go to Student Health.
  - **Non-Emergencies (work-related)**: Student-employees seeking non-emergency medical attention for exposures or injuries occurring in a UAB space as part of their job or volunteer duties (their employment) should follow procedures established by the **UAB On-The-Job Injury (OJI) Program** and go to The Workplace Clinic, within UAB Highlands between 7am-4pm (during weekdays). For all other times, student-employees should go to the University Hospital Emergency Department (UED), or Highland ED.
  - **Emergencies**: Students and student-employees seeking emergency medical attention for any UAB work or of curriculum-associated injury or exposure emergency should go to the University Hospital Emergency Department (UED), or Highland ED.

Reporting

To receive the following at no cost, you must report the exposure incident within 48 hours:

- A confidential medical exam
- Counseling
- Blood testing/analysis
- A confidential reply from the attending healthcare professional within 15 days

Despite the 48-hour reporting requirement, you are strongly encouraged to report all exposures and injuries immediately, since the timing of post-exposure treatment for HIV is a critical determinant of efficacy.

UAB On-The-Job Injury (OJI) Program

You are required to report any exposure or injury to a Supervisor, PI, or Manager. Completing the **OJI Application for Benefits** form, **Release of Information** form, and Trend Tracker Report, if available, is a requirement for any medical treatment with a chance of generating a bill.

The PI/Manager is also responsible for reporting the incident to the UAB Biosafety Officer in the Department of Occupational Health & Safety at (205) 934-2487. OH&S will investigate the circumstances surrounding the exposure, and work with the PI/Manager to modify work practices or develop additional prevention strategies.

Training and Hazard Communication

Employees whose job assignments place them at risk for BBP exposure must complete training within ten working days of initial appointment and annually after that. This Bloodborne Pathogens Training Course (OHS_BIO500) satisfies the initial and annual training requirement.

Employee Training

OSHA requires hazard communication to employees who may be exposed to Bloodborne Pathogens by the use of warning signs, labels, and annual employee training. Post Biohazard Warning Labels on or near the entrance to an area or lab where blood or OPIM is stored/used.

Signage will include:

- Universal Biohazard Symbol
- Special PPE requirements
- Name of biohazardous materials used
- Emergency contact information

All UAB Campus Employees with the potential for BBP exposure in their work environment must complete the Bloodborne Pathogens Training (OHS_BIO500) course annually. The Bloodborne Pathogens Training (OHS_BIO500) course is in the **UAB Learning System**. The PI is responsible for ensuring all laboratory personnel completes the Bloodborne Pathogens Training (OHS_BIO500) annually.

Hazard Communication

Biohazard Warning Labels must be:

- Red or fluorescent orange
- Imprinted with the Universal Biohazard Symbol
- Placed on all biohazard storage areas, medical waste containers, or equipment
- Applied to sample containers that are leaving the work area
- Posted on lab entrances
    - List names of infectious materials or agent(s) used in the lab (e.g., “Human tissues,” or “HBV”)
    - List requirements [e.g., PPE, training (if applicable)] for entry to the laboratory.

No specific Biohazard Warning Label is required for clinical specimens if the samples do not leave the facility and if Universal Precautions have been followed.

Methods of Exposure Control

Administrative and Workplace Controls

Administrative controls are typically described as the policies and Standard Operating Procedures (SOP's) in place to prevent exposures and safely work with hazardous materials, whereas workplace practices are the actual implementation of these policies and procedures.

Work areas **must be**:

1. Cleaned and decontaminated with an appropriate disinfectant:
    a. Daily, after work has concluded
    b. Immediately, after contamination with blood or OPIM
2. Labeled with a Universal Biohazard Symbol if used for storage or processing of human blood or OPIM

Handwashing

Wash hands as soon as possible in the following situations:

- After the removal of gloves or other PPE
- After any contact with human blood or OPIM
- Before leaving the work area

If liquid soap and water are not immediately available for handwashing, use antiseptic paper towels or an antiseptic hand lotion until a handwashing sink can be located.

Engineering Controls

Engineering controls eliminate or reduce exposure to BBP through the use or substitution of engineered safety machinery or equipment. Always use these types of controls when working with any infectious materials.

Safety Centrifuge Cups and Biosafety Cabinets (BSC) are the most common engineering controls used for the manipulation of blood and body fluids.

For more information see, **Appendix A of the BMBL**.

Sharps Containers

Always place sharps in the proper sharps containers! These containers should be:

- Made out of hard plastic
- Designed for the storage of used sharps
- Labeled with the Universal Biohazard Symbol
- Replaced when the contents reach the fill line on the container or when approximately ¾ full

Mechanical Pipettes

You use mechanical Pipettes must for transferring human blood or bodily fluids. **Mouth pipetting is prohibited!**

Needleless System

A needleless system is defined as "non-needle sharp or a needle with a built-in safety feature or mechanism that effectively reduces the risk of a percutaneous[1] exposure incident."

Personal Protective Equipment (PPE)

PPE is explicitly worn to prevent BBP exposures and contamination. Always wear PPE when working with human blood or OPIM. PPE must be replaced frequently, or immediately if it becomes contaminated or damaged in any way.

The PI or Department is responsible for supplying, replacing, or disinfecting PPE, as needed.

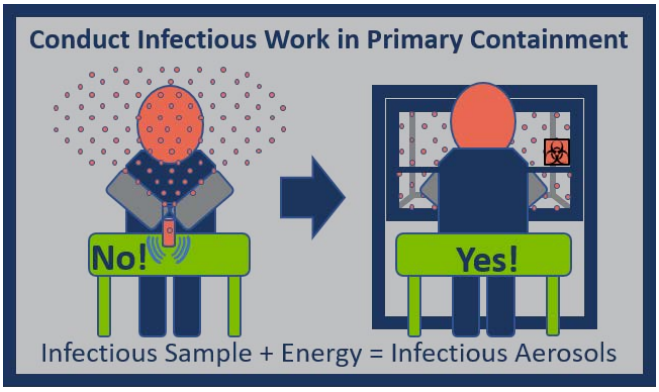
[1] Percutaneous means "administered, removed, or absorbed by way of the skin, as an injection, needle biopsy, or transdermal drug"

Minimal Required PPE:

- Appropriate Gloves - must be made of a material that does not absorb liquid (e.g., nitrile gloves).
  - **Never** reuse single-use gloves!
  - **Never** use ripped or compromised gloves.
- Cleaned and buttoned lab coat
- Safety glasses – Eye protection may be required if there are splash hazards and the type of procedure performed.
- Full-Face Shield (if there is a risk of a splash hazard)

2019 Featured Topic: Infectious Aerosols

Creation of Infectious Aerosols



Biological risk assessments consider both the inherent hazardous properties of an agent and the procedures and people involved in working with it. Natural transmission routes of an agent are informative, but alternative ways of exposure are also likely in the laboratory setting. For example, one might expect contaminated needlesticks or sharps injuries easily transmit mosquito-borne viruses, but many of these viruses also have infected laboratory personnel after samples were inadvertently aerosolized.

Proficiency, diligence, and the attitude of the individuals conducting the work are also factors that determine the likelihood and routes of exposures in the laboratory. Poor handwashing or glove-changing practices can quickly disseminate infectious agents to multiple surfaces. Similarly, sloppy or rushed sample processing techniques can exacerbate infectious aerosol production.

Infectious aerosols are particularly relevant in the research setting since most laboratory-associated infections (LAIs) occur by aerosol-based transmission. Any procedure imparting energy to a sample can create aerosols. The small size of infectious particles and a lack of awareness about activities that can develop aerosols, often increase the likelihood of an LAI. Activities that create aerosols include pipetting, vortexing, sonicating, and centrifuging samples. Because of their smaller volume, aerosols have a reduced infectious load capacity per particle, but these particles are efficiently disseminated and pose an infection risk to anyone in the vicinity. In contrast, droplets are larger and quickly settle from the air, but they also may contain higher loads of infectious agents that can be easily transferred to other laboratory surfaces, increasing the risk of mucous membrane or ingestion-based exposures.

Waste Disposal

Anything potentially contaminated with Bloodborne Pathogens should be disinfected appropriately or disposed of as medical waste — for example, specimen containers, pipette tips, syringes, needles, and culture plates, etc. If your lab generates or handles medical waste, you are **required** to complete the **Medical Waste Management for Labs (OHS_BIO301L)** training course.

Conclusion

This section concludes the **Bloodborne Pathogens Training (OHS_BIO500)** Course Material. The next step is to go through the Reality Check. These questions are not part of the assessment. After you finish, take the assessment. The passing score is 90% or higher.

If you have any questions about Bloodborne Pathogens, UAB Policies and Procedures about biological safety, or other related topics, contact UAB's Department of Occupational Health and Safety (OH&S) at (205) 934-2487.

Want to Learn More?

OH&S has developed many training courses that are available to all active UAB employees and students. These course topics include radiation safety, biosafety, bloodborne pathogens, chemical safety, controlled substances, building life safety, hazardous and medical waste, universal waste, PPE, hazard communication. While all courses are broadly available to the UAB community, the training may be intended for a particular audience at UAB. More detailed instruction or alternative reporting/response procedures may be appropriate, depending on your specific roles and responsibilities at UAB.

We have a **decision tree** to assist you in choosing the right course to match the knowledge/skills you may need at work every day as well. If you have any questions or comments, contact OH&S at (205) 934-2487.