Introduction

Welcome to the Bloodborne Pathogens (OHS_BIO500) Course. This course is designed for anyone that may be exposed to any Bloodborne Pathogens in their work environment or area.

This course is the **required** annual Bloodborne Pathogens Course.

Although this course is compliant with UAB training policies for UAB employees and students, there are other aspects to the **OSHA Bloodborne Pathogens Standard** that are not included in this course. If you have any questions, please call UAB's Department of Occupational Health and Safety (OH&S) at (205) 934-2487.

Objectives

This course outlines the Bloodborne Standard Precautions, you should use to protect yourself and others. At the conclusion of this course, participants should be able to:

- Identify and understand the issues associated with the Zika Virus. This would include:
  - Symptoms and treatment
  - Dangers to fetal development
  - General protective measures
  - OSHA guidance
- Apply the appropriate Bloodborne Standard key element to a given scenario correctly.
- Determine if UAB's Exposure Control Plan is being correctly followed in mock scenarios.
- Choose the appropriate precautions to take when working with bloodborne pathogens. This will include:
  - Signage
  - Biohazard precautions
  - Infectious diseases
  - Personal Protective Equipment (PPE)

- Distinguish between safe and unsafe procedures to handle and properly dispose of uncontaminated, possibly contaminated, and contaminated waste. This would include:
    - Sharps
    - Laboratory glassware
    - Disinfectants
- Prioritize the steps immediately following an exposure to human blood or OPIM.

2017 Featured Update: Zika Virus

The pandemic level of Zika Virus throughout Central and South America, and the fact that the geographical range of mosquitos that carry the virus extends into more than half of the continental U.S., suggests that it will only be a matter of time before local transmission is prevalent. Indeed, as of October 12th, 2016, over 128 locally-transmitted cases of Zika Virus Disease have been reported in Florida. The geographical range of the mosquitos may not be a limiting factor in the spread of the virus, as transmission can also occur through blood transfusion, sex, lab exposures, or from mother to fetus. Therefore, healthcare and laboratory workers should follow good infection control and biosafety practices (including universal precautions) as appropriate to prevent or minimize the risk of transmission of Zika Virus and other bloodborne pathogens.

Symptoms and Treatment

Only about 20% of individuals infected with Zika Virus will become ill. The symptoms are:

- Fever
- Rash
- Joint Pain
- Conjunctivitis

They are typically mild and last a few days to a week. Testing should be carried out on anyone who has traveled to affected areas and is symptomatic. Currently, only palliative treatments are available. Aspirin and other NSAIDS should be avoided until dengue fever is ruled out.

Dangers to Fetal Development

The Zika Virus infection during pregnancy may lead to significant birth defects. The virus can also be transmitted through sexual contact. Therefore, the CDC recommends pregnant women to avoid travel to Zika Virus-affected areas. Men who have traveled to affected areas should consistently and correctly use condoms, or abstain from sexual activity with partners that may become pregnant, or for the duration of pregnancy, for those with pregnant partners.

General Protective Measures

- **Avoid outbreak locales**. If possible, resist traveling to locations that are experiencing an epidemic. The CDC maintains a **travelers' health advisory site**, which informs travelers of regional disease transmission patterns and outbreaks.
- **Insect repellents.** Application of an **EPA-registered insect repellent** to skin and clothing is one of the easiest and most effective measures for avoiding mosquito bites. These include products containing DEET, Picaridin, IR3535, Oil of Lemon Eucalyptus, and Para-Menthane- Diol.
- **Wear protective clothing.** Minimize exposed areas of skin by wearing long-sleeved shirts, pants, boots, close-toed shoes with socks, and hats. Insect repellents applied to clothing offer added protection.

- **Eliminate breeding grounds.** Get rid of mosquito breeding sites by emptying standing water from flowerpots, buckets, and barrels. Change the water in pet dishes, and replace the water in birdbaths weekly. Drill holes in tire swings so water drains out. Keep wading pools empty and on their sides when they are not being used.

Protective Measures for Zika Virus Research Labs

- BSL-2 containment facilities and practices are appropriate for Zika Virus research laboratories. However, additional controls and PPE may be warranted, depending on the work being conducted.

- Risk assessments should be conducted and project registrations should be submitted and reviewed by the UAB IBC to determine whether specific procedures or specimens require higher levels or containment, special practices, and controls

- OSHA and NIOSH have offered **Interim Guidance for Protecting Workers From Occupational Exposure to Zika Virus**, and the CDC has posted guidance on **Laboratory Safety when Working with Zika Virus**.

Transportation of the virus falls under DOT Hazmat regulations and importation requires CDC or USDA permits. Contact UAB OH&S for more information.

The Standard

The Federal OSHA Bloodborne Pathogen Standard was designed to reduce and minimize the potential for occupational exposure to the Human Immunodeficiency Virus (HIV), the Hepatitis B Virus (HBV) and other human bloodborne pathogens.

A complete copy of OSHA Standard is **here**. A brief list of regulatory definitions can be found **here**.

Key Elements

Key elements of the bloodborne pathogens regulations include:

- Writing an Exposure Control Plan
- Performing a risk assessment and notifying employees in the area
- Offering HBV vaccinations to those employees at risk for HBV exposure ~~and~~ as well as post-exposure follow up procedures
- Offering Bloodborne Pathogen Training within 10 days of job assignment and requiring annual renewal

A copy of the UAB Biosafety Manual is available **here**.

Exposure Control Plan

The Plan **must** be updated: **annually**, **when new tasks are added**, **when significant changes (procedures or materials being used) have occurred**, and **when personnel changes have been made.**

The Plan **must be** read/reviewed every 365 days by everyone in the area that could potentially be exposed to human blood and/or OPIM.

The Standard requires that laboratories working with bloodborne pathogens prepare an **Exposure Control Plan**. The Plan must be designed to document procedures that minimize employee exposure to bloodborne pathogens. **Anyone coming in contact with human blood is at risk!**

Compliance Methods

In compliance with The Standard, Exposure Control Plans at UAB require:

- Universal Precautions
- Work Place Practices
- Engineering Controls
- Personal Protective Equipment (PPE)

Other requirements in your Exposure Control Plan:

- Housekeeping Procedures
- Regulated Medical Waste Disposal
- HBV Vaccination
- Post-Exposure Follow Up
- Hazard Communication
- Training

Biohazard Precautions

Warning Labels

Biohazard warning labels must be:

- Red or fluorescent orange
- Imprinted with the Universal Biohazard Symbol
- Placed on all biohazard storage areas, medical waste containers, work surface areas, or equipment (such as Biosafety Cabinets)
- Placed on sample containers when transporting from the work areas

Exceptions to Labeling Requirement

No specific biohazard is required for clinical specimens if the samples do not leave the facility or if Universal Precautions are followed in the facility.

Signage

Biohazard signs:

- Should include the universal biohazard symbol as shown here
- Be posted at the lab entrance(s)
- List names of infectious agent(s) used within the lab
- List special entry requirements for the area

Infectious Diseases

Requirements

The OSHA Standard includes specific guidelines for research personnel working in HIV or HBV laboratories. There also may be additional specialized facility requirements.

Standard microbiological practices **should** be followed.

- **Controls for Laboratory Safety**
- **Infectious Diseases**

Workers in HIV, HBV, and HCV laboratories *may require* special training in addition to what is presented in this training program. Special work practices must be followed, and specific containment equipment used. Ask your supervisor about your lab's **Agent Specific Data Safety Plan** for more detailed information if you have questions.

Personal Protective Equipment

Personal Protective Equipment (PPE) is specifically worn to prohibit human blood or OPIM from passing through to your clothing, skin, eyes, or mucous membranes.

Always wear Personal Protective Equipment (PPE) when working with human blood or OPIM.

Types

Gloves

- **Always** wear gloves when handling human blood or OPIM **and** during clean up procedures or whenever there is a possibility of contamination on a work surface.
- **Never** use ripped or compromised gloves.
- **Never reuse single use gloves!**
- Use latex alternative gloves if a latex allergy exists. Contact your Supervisor if an alternative solution is needed.

Goggles, Surgical Mask, or Face Shields

These must be:

- Worn if there is a possibility of a splash hazard to the face
- Made of a material that does not absorb liquid

If you have questions about PPE, ask your supervisor or call OH&S at (205) 934-2487.

Handling & Disposal

Sharps

The term "sharps" refers to needles, syringes, scalpel blades, lancets, disposable medical instruments, broken glass, and similar devices or materials sent through the waste stream that have the potential to cut and/or puncture an individual or the transport liner in which it is placed.

There may be variations to this policy in specific areas. All sharps activities that deviate from this policy must be reviewed by the OH&S prior to implementation. You should consult operating manuals and Standard Operating Procedures (SOPs) in your work area.

Sharps, whether contaminated or not, must be disposed of as medical waste. These **MUST** never be placed in the regular trash. Contact OH&S if you need assistance disposing of medical waste in your area.

- Place **all** needles, syringes, and other sharps into rigid, red plastic sharps containers.
- Never remove needles from syringes.
- Do **not** cut, bend or recap needles.
- Secure the sharps container lid when it is full.
- Never overfill sharps containers and risk getting stuck.

This policy applies to **all** needles and syringes, whether (a) used or unused, (b) used together or separately, (c) used with human blood, or (d) used for any other purpose.

Laboratory Glassware

Uncontaminated

Uncontaminated glassware **must** never be placed directly into the regular trash can. This applies to glass items from medical, research, and teaching labs. This includes flasks, beakers, pipettes, tubing, glass slides, and cover slips, etc.

Uncontaminated glassware must be placed in a rigid container that is puncture resistant (i.e., cardboard boxes, plastic, or metal drums). This rigid container **must** be labeled "Caution – Broken Glass."

When the container becomes full, secure the top of the container with tape. The **uncontaminated glassware** waste that is contained in a rigid container may be disposed of in the regular trash.

All uncontaminated glassware (broken or unbroken) **must** disposed of as broken glass.

Contaminated

Contaminated glassware which may be contaminated with infectious agents should be placed in approved sharps containers. The containers can then be treated as described in the **UAB Medical Waste Management Plan**.

Disinfection

Autoclaving

Please contact OH&S at (205) 934-2487 to determine if you must pre-treat your waste before pick up by the contractor.

Autoclaving is a commonly used procedure for treating medical (infectious) waste. **The** American Section of the International Association for Testing Materials (ASTM-D) compliant bags that are strong, pliable, and puncture resistant are recommended for autoclaving infectious materials.

Do not place needles, broken glass, or other sharps in autoclave bags whether or not a pre-treatment is required. After autoclaving, these bags are placed in transport containers for pickup by the contractor.

Regardless of their contents, **do not** place red bags in the regular trash for disposal. This practice can result in regulatory action, fines, and even loss of landfill privileges.

If you are responsible for managing your labs medical waste, you are **required** to complete the Medical Waste Management for Labs (OHS_BIO301L) training course.

Chemical Disinfection

Volatile chemicals or radioactive materials must not be autoclaved. If pre-treatment is required, contact Chemical Safety or Radiation Safety as appropriate.

Use the following table to aid in the selection of disinfectants. Follow manufacturer's recommended concentrations, expiration dates, and contact times.

Disinfectant	Uses	Concentrations	Cons
Alcohol*	Ethyl or isopropyl alcohol is a good general purpose disinfectant	70 – 80% concentration	Not effective against bacterial spores
Phenols*	Effective against vegetative bacteria, fungi, and enveloped viruses containing lipids	1-5% concentration	Unpleasant odor, irritant
Formaldehyde*	Formalin is a good disinfectant against vegetative bacteria, spores, and viruses	5 – 8% concentration	Irritating odor and is a known carcinogen
Quaternary Ammonium Compounds*	Cationic detergents are strongly surface active; extremely effective against enveloped viruses; may be neutralized by anionic detergents (i.e., soaps).	.5-3% concentration	Ineffective against bacterial spores
Chlorine*	Active against vegetative bacteria and most viruses; laundry bleach (5.25% chlorine) may be diluted (one part bleach to 9 parts water) and used as a disinfectant	Low concentration (50 – 500 ppm) 2,500 PPM are required for bacterial spores	Higher concentrations corrosive to metal surfaces; must be prepared fresh
Iodine*	Recommended for general use; effective against vegetative bacteria and viruses	2-7% concentration	Less effective against bacterial spores
Glutaraldehyde*	Very good disinfectant; high level disinfectant	.12% - 2.4% concentration depending on use	Is an irritant and toxic

*Anyone that works with any disinfectant should follow the manufacture's concentration and contact time instructions. This chart is in PDF format and can be found **here**.

Incidents

If you are exposed to human blood or OPIM:

- Wash affected areas with soap and water
- Flush mucous membranes with water
- Immediately notify your supervisor
- Contain spilled materials
- Decontaminate

Reporting

- On campus, contact UAB Hospital Employee Health Rapid Response Team (RRT) at 934-3675 or page 934-3411
- Consult with the On-the-Job Injury program outlined in the **You and UAB Handbook**
- Consult with your supervisor and complete the required **On-The-Injury Form**.

If a report of an exposure incident occurs within 48 hours, a potentially exposed employee will be offered at no cost:

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

Conclusion

What should you remember from this course? There are certain practices that you can implement to better protect yourself and your co-workers. Your area's Exposure Control Plan should contain everything that you need to know about working with and/or around the specific bloodborne pathogens that could be in your area.

This concludes the Bloodborne Pathogens (OHS_BIO500) Course. If you have not taken the assessment, please do so now. You must score 80% or higher to pass.

Retain the certificate in your lab file. You may be asked to present proof of your training.

Remember: If you are responsible for managing your labs medical waste you are **required** to complete the Medical Waste Management for Labs (OHS_BIO301L) training course.

If you have any questions about Bloodborne Pathogens, UAB Policies and Procedures pertaining to biological safety, or other related topics, please contact UAB's Occupational Health and Safety at 205-934-2487.

Want to Learn More?

OH&S has many training courses available to all UAB active employees and students. This includes topics such as in-depth radiation training, biosafety, bloodborne pathogens, chemical safety, controlled substances, building life safety, hazardous and medical waste, universal waste, PPE, hazard communication, etc.

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, please feel free to contact OH&S at (205) 934-2487.