ENVIRONMENTAL HEALTH AND SAFETY

BLOODBORNE PATHOGENS EXPOSURE CONTROL PLAN

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Status

Contact(s)	Implementation Date	Comments
Kim Southworth, EHS	December 2014	Initial written program created.
Kim Southworth, EHS	January 2016	Minor updates.
Shanda Judge and Val Freeman, EHS	September 2025	Minor updates.

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A: WORKPLACE SPECIFIC INFORMATION

Laboratory/Workplace Bloodborne Pathogens (BBP) Manual Information					
Supervisor(s):					
Department:		**Building:**		**Room number(s):**	

Environmental Health and Safety (EHS) BBP Managers	
XX Laboratory Safety Inspector 405.744.xxxx	Kim Southworth Director 405.744.7243

Laboratory Employee	Title/Job Description	Contact Information

B: INTRODUCTION TO THE OSHA BBP STANDARD

The Occupational Safety and Health Administration (OSHA) promulgated the Bloodborne Pathogens standard, 29 CFR 1910.1030, on December 6, 1991. The standard's primary purpose is to protect employees from the risk of exposure to bloodborne pathogens while performing their occupational duties. At the time of the standard's promulgation, three viruses were of highest concern. These included the human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV). However, all microorganisms that are pathogenic to humans, and can be transmitted through blood or potentially infectious materials (PIM), are considered to be bloodborne pathogens.

The OSHA Bloodborne Pathogens standard requires employers to ensure that risks of exposures to bloodborne pathogens are properly mitigated through the use of standard/universal precautions, engineering controls, administrative controls, training, personal protective equipment, and a HBV vaccination program. Furthermore, the Bloodborne Pathogens standard requires the employer to offer medical treatment to any employees exposed to blood or PIM. The standard also contains requirements for recordkeeping and the implementation of an exposure control plan (ECP).

In 2001, the Needlestick Safety and Prevention Act was added to the Bloodborne Pathogens standard. This act requires employers who use sharps to complete an annual review of engineering controls and to consider technology that could reduce exposures to bloodborne pathogens.

THE RYAN WHITE ACT (FIRST RESPONDERS AND EMS PERSONNEL)

In addition to the Bloodborne Pathogens standard, EMS/first responders are subject to the Ryan White Act of 2009. The Centers for Disease Control and Prevention (CDC) is responsible for keeping a list of potentially life-threatening diseases that must be reported by medical facilities to EMS/first responders when one of those diseases is found in a patient transported to their facility. The Ryan White Act requires that facilities respond to requests for patient infectious disease information within 48 hours.

Diseases routinely transmitted by contact or body fluid exposures:	Diseases routinely transmitted through aerosolized airborne means:	Diseases routinely transmitted through aerosolized droplet means:	Diseases caused by agents potentially used for bioterrorism or biological warfare:
Anthrax, cutaneous (Bacillus anthracis)	Measles (Rubeola virus)	Diphtheria (Corynebacterium diphtheriae)	These diseases include those caused by any transmissible agent included in the HHS Select Agents List (Appendix A)
Hepatitis B (HBV)	Tuberculosis (Mycobacterium tuberculosis) – infectious pulmonary or laryngeal disease; or extrapulmonary (draining lesion)	Novel influenza A viruses as defined by the Council of State and Territorial Epidemiologists (CSTE)	
Hepatitis C (HBV)	Varicella disease (Varicella zoster virus) – chickenpox, disseminated zoster	Meningococcal disease (Neisseria meningitides)	
Human immunodeficiency virus (HIV)		Mumps (Mumps virus)	
Rabies (Rabies virus)		Pertussis (Bordetella pertussis)	
Vaccinia (Vaccinia virus)		Plague, pneumonic (Yersinia pestis)	
Viral hemorrhagic fevers (Lassa, Marburg, Ebola, Crimean-Congo, and other viruses yet to be identified)		Rubella (German measles; Rubella virus)	
		SARS-CoV	

SELECTED INFECTIOUS AGENTS

Hepatitis B Virus

Hepatitis B virus causes inflammation of the liver, and can ultimately lead to chronic liver disease. This virus can survive for up to one week in dried blood, and is transmitted when blood or PIM enters the body of a non-infected person. The general symptoms of hepatitis B include jaundice, fatigue, abdominal pain, nausea, or vomiting, however, most people who contract this disease are asymptomatic; this can delay detection and treatment of the virus. There is a vaccination for Hepatitis B, and it has proven to be effective in 95% of those who receive it.

Hepatitis C Virus

Hepatitis C is the most common chronic bloodborne infection in the United States, affecting about 3.5 million people. Symptoms of the infection are similar to those of Hepatitis B, however, up to 85% of those infected with

Hepatitis C develop long-term infection and chronic liver disease. There is no vaccination for Hepatitis C, but the FDA approved a medication that treats all forms of this virus in August of 2017.

Human Immunodeficiency Virus

Human immunodeficiency virus (HIV) is the virus that leads to AIDS. HIV weakens the immune system by destroying the cells responsible for fighting infection. Routes of exposure include unprotected sex with someone infected with HIV, sharing needles, childbirth, being stuck with an HIV-contaminated needle or sharp, and contact with broken skin, wounds, or contaminated body fluids. The Centers for Disease Control and Prevention(CDC) reports that the virus cannot be spread by air, water, insects, saliva, tears, sweat, casual contact, or closed mouth contact. HIV does not survive well outside the body. While there is no effective cure for this virus, symptoms can be managed through proper medical treatment.

Anthrax

Anthrax is an infectious disease caused by the bacteria Bacillus anthracis. This disease most commonly infects warm-blooded animals, but also infects humans through the inhalation, ingestion, or direct blood contact with spores from these infected animals. Once the spores become active, the bacteria multiply, spread throughout the body, and cause severe illness. Symptoms of anthrax are highly dependent on the type of infection, but commonly include blisters, rashes, fever, chills, headaches, respiratory, and gastrointestinal symptoms. Approximately 20% of untreated cases will die from the infection, however, all types of anthrax can be prevented and treated with antibiotics as long as immediate medical care is sought out after an exposure.

Rabies Virus

Rabies is a preventable viral disease of mammals that is most commonly transmitted through the bite of a rabid animal. This virus infects the central nervous system, ultimately causing disease in the brain and death. Early symptoms of rabies infection include fever, headaches, and fatigue, but as the disease progresses, the infected person may exhibit anxiety, confusion, insomnia, hydrophobia, difficulty swallowing, and even paralysis. Death usually occurs within days of the onset of these symptoms. Post-exposure prophylaxis is available and effective, however, it is important to seek medical attention as soon as possible after the exposure occurs.

Vaccina Virus

Vaccinia, a virus related to smallpox, is transmitted through both direct and indirect contact, with most laboratory exposures occurring through accidental needle sticks and eye splash accidents. The poxviruses are one of the largest known DNA viruses and are distinguished from other viruses by their ability to replicate entirely in the cytoplasm of infected cells, without the need for host replication machinery found in the nucleus. This virus is of scientific interest due to its use as a vector for active immunization against other diseases, like Hepatitis B, Herpes Simplex Virus, and even HIV. Vaccinia is used as a live-virus vaccine against smallpox, and the smallpox vaccine can be administered for those that have become infected with Vaccinia virus.

Viral Hemorrhagic Fevers

Arenaviruses are viruses of zoonotic origin, and include the Lassa fever virus. Humans can become infected via aerosols from infected rodents, exposure to infected urine, feces, tissues, or through rodent bites, and can transmit these viruses to other humans by direct contact with secretions and bodily fluids. Symptoms of the infection include fever, shock, and hemorrhage, but can also be accompanied with hepatitis and myocarditis. Mortality rate is estimated between 10 – 50%, but if treated within six days of illness onset, treatment options can be effective.

Filoviruses, which include Marburg and Ebola virus, are RNA viruses that cause severe or fatal hemorrhagic fevers. Endemic in Africa, initial cases of these viruses included transmission from monkeys. Marburg and Ebola virus infections begin with flulike symptoms, and progress to hemorrhages, especially in the gastrointestinal tract. Death occurs in as many as 90% of patients with clinically evident disease, and any laboratory diagnosis or research must be done following biological safety level 4 isolation procedures.

Crimean-Congo Hemorrhagic Fever (CCHF) virus has a case fatality rate of up to 40%. The virus is transmitted to people either by tick bites or through contact with infected animal blood or tissues. Human-to-human transmission occurs from close contact with blood and bodily fluids of infected persons. General supportive care with treatment of symptoms is the main approach to managing CCHF in people, with antiviral medications proving effective.

C: GENERAL POLICY

SCOPE

This policy applies to all Oklahoma State University departments whose employees may reasonably anticipate contact with blood or other potentially infectious materials (OPIM) during the performance of their duties.

POLICY

In compliance with the Bloodborne Pathogens Standard, the University requires all departments that fall within the scope of this policy to minimize employee risk from exposure and infection by implementing Exposure Control Plans (ECP) in the form of departmental policy.

RESPONSIBILITY

Departmental supervisors shall be responsible for ensuring their employees comply with the provisions of this plan. Each University department is responsible for providing all necessary supplies such as personal protective equipment, soap, bleach, Hepatitis B vaccinations, etc. Hepatitis B vaccinations shall be administered through OSU's University Health Services. The Environmental Health and Safety Department (EHS) shall be responsible for training University employees.

PROGRAM ADMINISTRATION

Individual or Department	Responsibilities	Contact Information
	responsible for the implementation of the ECP; and will maintain, review, and update the ECP at least annually, and whenever necessary to include new or modified tasks and procedures.	
	will maintain and provide all necessary personal protective equipment (PPE), engineering controls (e.g., sharps containers), labels, and red bags as required by the standard; and will ensure that adequate supplies of the aforementioned equipment are available in the appropriate sizes.	
	will be responsible for ensuring that all medical actions required are performed and that appropriate employee health and OSHA records are maintained.	
	will be responsible for ensuring that all employees attend an annual EHS bloodborne pathogen training, keep documentation of training, and making the written ECP available to employees, OSHA, and NIOSH representatives. Will also ensure that employees are provided with laboratory-specific training annually.	

Employees covered by the bloodborne pathogens standard receive an explanation of this ECP during their initial training session. It will also be reviewed in their annual refresher training and documented. All employees have an opportunity to review this plan at any time during their work shifts by contacting _____ (individual or department). If requested, we will provide an employee with a copy of the ECP free of charge and within15 days of the request.

PROCEDURE

Exposure Determination

Supervisors or PIs will determine which employees are occupationally exposed (at-risk from occupational exposure) to bloodborne pathogens by reviewing job classifications and specific tasks and procedures according to procedures described in Section 2 of this Exposure Control Plan. The determination results will be recorded and may be found in that same section. Employees classified as occupationally exposed will qualify for various provisions of this policy addressing exposure control.

Methods of Compliance

Exposure control methods concerning administrative controls, engineering controls, personal protective equipment, and housekeeping will be implemented as Standard operating procedures. Details of the standard procedures are described in Section 3 of this Exposure Control Plan.

HIV and HBV Research Laboratories and Production Facilities

Specialized control methods are required for areas that present an exceptional pathogen risk to employees. The specialized methods address standard and special microbiological practices, containment equipment, special lab practices and disposal methods. Additional training and skill requirements are also *described in Section 4* of this Exposure Control Plan.

Hepatitis B Immunization Program

The hepatitis immunization series will be provided, free-of-charge, to all employees determined to be at-risk from their regular handling of human body substances. The immunization program will be conducted through an approved occupational medical provider, as *described in Section 5* of this Exposure Control Plan.

Post-Exposure Evaluation and Follow-Up

In the event an employee sustains an occupational exposure to human blood or body substances, evaluation, follow-up, and counseling will be provided free-of-charge. The evaluation and follow-up program will be conducted as *described in Section 6* of this Exposure Control Plan.

Communication of Hazards to Employees

The workplace risks associated with human body substances will be effectively communicated to at-risk employees. Prudent practices and mandatory safety procedures in the ECP will be described in detail. The information will be communicated to the employees in a manner *described in Section 7* of this Exposure Control Plan.

Recordkeeping

Employee records concerning training, exposures, medical surveillance, etc. will be maintained according to specific methods *described in Section 8* of this Exposure Control Plan. Sharps injury and exposures are reported to Human Resources along with the Employee Injury Report. Injury reports and logs should be maintained by Department and Human Resources.

Annual Review, Self-Inspection and Update

Exposure control methods concerning administrative controls, engineering controls, personal protective equipment, and housekeeping will be implemented as Standard operating procedures. Details of the standard procedures are described in Section 3 of this Exposure Control Plan

D: EXPOSURE DETERMINATION

POLICY

The Supervisor, Principal Investigator or designated Laboratory Supervisor shall determine the exposure risk of employees, both in terms of position descriptions and specific task categories, and classify the employees as "Occupationally-exposed" or "Non-exposed" for the purposes of training, recordkeeping, protective equipment, and Hepatitis B immunization. Occupational Exposure means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duty. Other Potentially Infectious Materials (OPIM) means (1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva, 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; (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); (3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV; and (4) Non-human primate tissues, organs or blood.

PROCEDURE

Exposure determination will be made without regard to the use of personal protective equipment.

The following forms will be completed to document the exposure determination of all occupationally exposed employees as described in the above definition:

- **TABLE 1** - List all job/position descriptions/titles in which ALL employees handle human body substances and OPIM.

- **TABLE 2** - List all job/position descriptions/titles in which SOME employees handle human body substances and OPIM. Included is a list of tasks and procedures (or groups of closely related tasks and procedures) which occupational exposures may occur for these individuals.

Employees whose job/position descriptions/ categories/titles are listed in Table I and Table II are entitled to the protection of the Bloodborne Pathogens Standard and this Policy.

Employees whose job/position descriptions/categories/titles do not have occupational exposure to bloodborne pathogens may be entitled to protection under other OSHA Standards including, but not limited to:

29 CFR 1910.1200 "Hazard Communication"
29 CFR 1910.1450 "Laboratory Safety Standard"

TABLE 1 **Job, department/location, or task/procedure in which ALL employees have occupational exposure** [For compliance with 29 CFR 1910.1030(C)(2)(I)(A)]		
Job Title	**Department**	**Task/Procedures**
Example: Phlebotomist	*Clinical Lab*	*Performing normal phlebotomist duties*

TABLE 2
Job, department/location, or task/procedure in which SOME employees have occupational exposure and closely-related groups of tasks and procedures in which occupational exposure occurs
[For compliance with 29 CFR 1910.1030(C)(2)(I)(A)]

Job Title	Department	Task/Procedures
Example: Housekeeper	*Environmental Services*	*Handling regulated waste*

E: METHODS OF COMPLIANCE

POLICY

Operations that use human body substances and OPIM will minimize employee risk from bloodborne pathogens by selecting appropriate control measures from the list below, and implementing them as standard written procedures in the work area/lab.

PROCEDURE

General Administrative Controls

- Universal precautions will be observed to prevent contact with blood or other potentially infectious materials. Universal precautions are an approach by which all human blood and body fluids are treated as if they are potentially infectious for bloodborne pathogens.
- In addition to following universal precautions, CDC guidelines from "Biosafety in Microbiological and Biomedical Laboratories' (BMBL) should also be followed.
- For assistance or questions about biohazard bags and labels, please contact EHS, at 405- 744-7241 or ehs@okstate.edu.

_____ (individual or department) will ensure warning labels are affixed or red bags are used as required if regulated waste or contaminated equipment is brought into the facility.

Employees are to notify _____ (individual or department) if they discover regulated waste containers, refrigerators containing blood or OPIM, contaminated equipment etc. without proper labels.

TABLE 3: Universal & Standard Procedures
Recommended by the Association for Professionals in Infection Control and Epidemiology

Component	Recommendations
Hand hygiene	After touching blood, body fluids, secretions, excretions, contaminated items, or other PIM; after removing gloves; between patient contacts
Gloves	For touching blood, body fluids, secretions, excretions, contaminated items, or other PIM; for touching mucous membranes and non-intact skin
Gown	During procedures and patient-care activities when contact of clothing/exposed skin with blood, body fluids, secretions, excretions, or other PIM is anticipated
Mask, eye protection (goggles), face shield	During procedures and patient-care activities likely to generate splashes or sprays of blood, body fluids, secretions, excretions, or other PIM
Soiled patient-care equipment	Handle in a manner that prevents transfer of microorganisms to others and to the environment; wear gloves if visibly contaminated; perform hand hygiene
Environmental control	Develop procedures for routine care, cleaning, and disinfection of environmental surfaces, especially frequently touched surfaces
Textiles and laundry	Handle in a manner that prevents transfer of microorganisms to others and the environment
Needles and other sharps	Do not recap, bend, break, or hand-manipulate used needles; use safety features when available; place used sharps in puncture-resistant container
CPR	Use mouthpiece, resuscitation bag, other ventilation devices to prevent contact with mouth and oral secretions

Respiratory hygiene/cough etiquette	Instruct symptomatic persons to cover mouth/nose when sneezing/coughing; use tissues and dispose in no-touch receptacle; observe hand hygiene after soiling of hands with respiratory secretions; wear surgical mask if tolerated or maintain spatial separation (> 3 feet if possible)

Engineering and Work Practice Controls

- Engineering and work practice controls will be used to reduce or eliminate potential employee exposures to human blood and body fluids. Where occupational exposure remains, after institution of these controls, personal protective equipment will also be used.
- Engineering controls will be reviewed and updated on a yearly schedule to ensure their effectiveness. OSHA records, employee interviews and activities will help identify the effectiveness and need for changes in engineering controls.
- Autoclave logs must be maintained. The logs should include the date, load number, cycle length, and if the autoclave indicator (autoclave tape, bag indicator, etc.) indicates sterility. Biological indicators must be used monthly, and the results must be recorded.
- Readily accessible hand washing facilities in conjunction with paper towels will be provided to employees. When provision of hand washing facilities is not feasible in a work area, employees will be provided with either an appropriate antiseptic hand sanitizer (with 60% alcohol or greater) or antiseptic towelettes. Supervisors will ensure that employees wash their hands immediately or as soon as feasible after removal of gloves or other personal protective equipment.
- Supervisors will ensure that employees wash any exposed skin with soap and water and flush mucous membranes with water immediately following contact of such body areas with blood or other potentially infectious materials.
- Sharps containers must be available if sharps are used in the workplace.
- Contaminated needles and other contaminated sharps will not be bent, recapped. Shearing or breaking of contaminated needles is prohibited.
- Sharps safety devices must be used if feasible, appropriate, commercially available, and effective at reducing exposures to blood or OPIM. Sharps with Engineered Sharps Injury Protections (SESIPs) encompass a broad array of devices including syringes with guards or sliding sheathes, needles that retract into the syringe after use, needless IV medication systems, and plastic capillary tubes. Becton, Dickinson and Company offers SESIPs and additional information.
- Immediately or as soon as possible after use, contaminated reusable sharps will be placed in appropriate containers until properly reprocessed. These containers will be:
  - Closable
  - Puncture resistant
  - Labeled or color-coded
  - Leak-proof on the sides and bottom
  - Stored or processed in a manner that does not require employees to reach by hand into the containers
- Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a reasonable likelihood of occupational exposure. Food and drink will not be kept in refrigerators, freezers, shelves, cabinets, or on countertops or bench tops where blood or other potentially infectious materials are present. All procedures involving blood or other potentially infectious materials will be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances. Mouth pipetting/suctioning of blood or other potentially infectious materials is prohibited.
- Specimens of blood or other potentially infectious materials will be placed in a container that prevents leakage during collection, handling, processing, storage, transport, or shipping. When universal precautions are used for handling all specimens within a facility and the specimens are not destined to leave the facility, the labeling or color-coding of specimen containers as biohazardous is not necessary, provided containers are recognizable as containing specimens. When such specimens and containers are destined to leave the facility, they will be labeled with the internationally recognized biohazard logo and the word “biohazard”.

- If outside contamination of the primary container occurs, the primary container will be placed within a second container that prevents leakage and is properly labeled as containing biohazardous materials. If the specimen could puncture the primary container, the container will be placed within a second container that is puncture-resistant in addition to the above characteristics.
- Equipment that may become contaminated with blood or other potentially infectious materials will be examined prior to servicing or shipping and will be decontaminated as necessary, unless it can be demonstrated that the decontamination of such equipment or portions of such equipment is not feasible. A readily observable label containing the internationally recognized biohazard logo and the word "biohazard" will be attached to the equipment stating which portion remains contaminated. The departmental management will ensure that information pertaining to the contamination status of a piece of equipment is conveyed to all affected employees, the servicing representative, and/or the manufacturer, as appropriate, prior to handling, servicing, or shipping, so that appropriate precautions will be taken.

The specific engineering controls and work practice controls used are listed below:

_____

_____

_____

_____

_____

Personal Protective Equipment

- When there is potential occupational exposure, employees will be provided, at no cost to the employee, with appropriate personal protective equipment such as, but not limited to gloves, gowns, laboratory coats, face shields or masks and eye protection. Personal protective equipment will be considered appropriate only if it does not permit blood or other potentially infectious materials to pass through to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use.
- Management will ensure that employees use appropriate personal protective equipment and that the equipment in the appropriate sizes is readily accessible at the worksite or is issued to employees. Employees who demonstrate sensitivity to certain personal protective items, such as latex gloves, will be supplied with hypoallergenic versions of the equipment or protective liners or alternative equipment that allows the same level of performance of duties.
- Cleaning, laundering, and disposal of personal protective equipment will be provided by the work center at no cost to the employees. The department will repair or replace personal protective equipment as needed to maintain its effectiveness, at no cost to the employees. If blood or other potentially infectious materials penetrate a garment, the garment will be removed immediately or as soon as feasible.
- All personal protective equipment will be removed prior to leaving the work area. When personal protective equipment is removed it will be placed in an appropriately designated area or container for storage, washing, decontamination, or disposal. Gloves will be worn when it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, or non-intact skin; and when handling or touching contaminated items or surfaces. Disposable (single use) gloves, such as surgical or examination gloves, will be replaced as soon as practical when contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised.
- Disposable gloves will not be washed or decontaminated for re-use. Utility gloves may be decontaminated for re-use if the integrity of the glove is not compromised. However, they must be discarded if they are cracked, peeling, torn, punctured. Employees will wear gloves during all phlebotomies they may perform. Masks in combination with eye protection devices, such as goggles or glasses with solid side shields, or chin-length face shields, will be worn whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated.

- Masks in combination with eye protection devices, such as goggles or glasses with solid side shields, or chin-length face shields, will be worn whenever splashes, spray, spatter, or droplets of blood or OPIM are generated.
- Appropriate protective clothing such as, but not limited to, gowns, aprons, lab coats, clinic jackets, or similar outer garments will be worn in occupational exposure situations. Surgical caps or hoods and/or shoe covers or boots will be worn in instances when gross contamination can reasonably be anticipated (e.g. autopsies, infectious animal dissection).

PPE is located _____ (location) and may be obtained through _____ (individual or department). *Specify how employees are to obtain PPE and who is responsible for ensuring it is available.

Housekeeping and Waste Disposal

- Management will ensure that the worksite is maintained in a clean and sanitary condition. Management will determine and implement an appropriate written schedule for cleaning and method of decontamination based upon the location within the facility, type of surface to be cleaned, type of soil present, and tasks or procedures being performed in the area.
- Cleaning of contaminated work surfaces after completion of procedures is required to ensure that employees are not indirectly exposed to blood or OPIM remaining on a surface. Appropriate disinfectants include a 10% bleach solution (made fresh daily) and EPA-registered tuberculocides (List B disinfectants). Contact time of the disinfectant should be at least 10 minutes. It is important to note the 70% alcohol cannot be used as a primary disinfectant. The following are some examples of appropriate disinfectants.
  - 10% bleach solutions (made with 5.25% available chlorine in a 1/10 dilution with water)
  - Cavicide/Caviwipes (Metex Research Corporation)
  - Sani-Cloth (PDI)
  - Oxivir TB (Diversey, Inc.)
  - Clean-Cide Wipes (Wexford Labs, Inc.)
- All equipment and environmental and working surfaces will be cleaned and decontaminated after contact with blood or other potentially infectious materials. Contaminated work surfaces will be decontaminated with an appropriate disinfectant after completion of procedures; immediately or as soon as feasible when surfaces are overtly contaminated, or after any spill of blood or other potentially infectious materials; and at the end of the work shift if the surface may have become contaminated since the last cleaning.
- Protective coverings, such as plastic wrap, aluminum foil, or impervious-backed absorbent paper used to cover equipment and environmental surfaces, will be removed and replaced as soon as feasible when they become overtly contaminated or at the end of the workshift if they may have become contaminated during the shift.
- All bins, pails, cans, and similar receptacles intended for reuse that have a reasonable likelihood for becoming contaminated with blood or other potentially infectious materials will be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.
- Spills must be cleaned up immediately. Use personal protective equipment appropriate to prevent OPIM from coming in contact with your hands, mucous membranes, non-intact skin, or penetrating protective clothing. For most spills, a lab coat or disposable gown and gloves is sufficient.
  - Clean up and absorb liquid material with paper towels or other absorbent materials to prevent spill from spreading.
  - Discard paper towels used to soak up spill in a biohazardous waste container.
  - Disinfect the spill area by first laying absorbent material over spill area, and then gently add a 10% bleach solution or other appropriate disinfectant and allow it to soak for the required contact time (30 minutes if not specified).
  - Always wash hands after cleaning up a spill.

- Broken glassware that may be contaminated will not be picked up directly with the hands. It will be cleaned up using mechanical means such as a brush and dustpan, tongs, or forceps. Reusable sharps that are contaminated with blood or other potentially infectious materials will not be stored or processed in a manner that requires employees to reach into the containers with their hands.
- Contaminated sharps waste will be discarded immediately or as soon as feasible in containers that are:
    - closable
    - puncture-resistant
    - leak-proof on sides and bottom
    - labeled with the international biohazard logo and the word "biohazard"
- During use, containers for contaminated sharps waste will be:
    - easily accessible
    - located at the point of generation
    - maintained upright throughout use
    - replaced routinely and not allowed to be overfilled
- When moving containers of contaminated sharps waste from the area of use, the containers will be:
    - closed prior to removal
    - placed in a secondary container if leakage is possible
- The secondary container will be:
    - closable
    - constructed to contain all contents and prevent leakage during handling
    - labeled as biohazardous
    - Reusable containers will not be opened, emptied, or cleaned manually or in any other manner that would expose employees to the risk of needle sticks or cuts.
- If outside contamination of the waste container occurs, it will be placed in a second container that meets the criteria listed above.
- Non-sharps contaminated waste will be placed in containers that are:
    - closable
    - constructed to contain all contents and prevent leakage of fluids during handling
    - labeled as biohazardous
    - closed prior to removal.
- All biohazardous waste must be decontaminated before disposal or pick-up. A log sheet should be kept as a record of decontamination/inactivation of biohazardous waste.
    - Autoclaves must, on a monthly basis, pass performance checks with biological indicators.
    - All chemical decontamination/inactivation methods must be recorded with accurate dates/times.
- Incineration of biohazardous waste shall be handled by a biological waste destructor. EHS can assist if pre-existing disposal arrangements have not already been made through University Health Services or the Seretean Wellness Center.

Sharps disposal containers are inspected and maintained or replaced by _____ (individual or department) every _____ (frequency) or whenever necessary to prevent overfilling.

Contaminated Laundry

Management is responsible for providing laundry services for contaminated re-usable garments. The following practices must be followed.

- Contaminated laundry will be handled as little as possible to prevent agitation.
- Gloves and appropriate PPE should be used when handling contaminated laundry.
- The contaminated laundry should be placed and transported in bags or contained in leak-proof containers labeled or color-coded with the international biohazard logo.
- All items requiring laundering will not be sorted or rinsed in the area of use.
- Laundry items should be soaked in a 10% bleach solution before washing in a machine, if possible.

    - The employer will clean and launder PPE at no cost to the employee.
- A workplace specific standard operating procedure should be established on laundering procedures.
- EHS can assist with the coordination of cleaning or disposal of contaminated laundry.

F: HIV & HBV RESEARCH LABORATORIES & PRODUCTION FACILITIES

POLICY

HIV and HBV research laboratories and production facilities present increased risk for occupational exposure to bloodborne pathogens. All laboratories engaged in bloodborne pathogens infectious disease research will reduce employee exposure risk by providing additional administrative controls, protective equipment, information and training beyond that required for research laboratories not involved in such work.

PROCEDURE

Employees working in HIV and HBV Research Laboratories and Production Facilities will adhere to standard microbiological safety practices as described in the CDC/NIH Guidelines for Biosafety in Microbiological and Biomedical Research Laboratories - Laboratories - Section III, Biosafety Level 2, part A. These standard practices offer limited control of hazards associated with microbiological research.

The following special practices will be followed in HIV and HBV Research Laboratories AND Production Facilities:

- A biosafety manual will be prepared or adopted and periodically reviewed and updated at least annually. Personnel will be advised of the potential hazards, will be required to read instructions on practices and procedures, and will be required to follow them.
- Access to the work area will be limited to authorized persons. Only persons who have been advised of the potential biohazard, who meet any specific entry requirement, and who comply with all entry and exit procedures will be allowed to enter the work areas.
- A hazard warning sign incorporating the universal biohazard symbol and the word “biohazard” will be posted on all access doors.
- Laboratory doors will be kept closed when work involving HIV or HBV is in progress.
- Before disposal, all contaminated waste will either be incinerated or decontaminated by a method, such as autoclaving, known to effectively destroy bloodborne pathogens.
- Contaminated materials that are to be decontaminated at a site away from the work area will be placed in a durable, leakproof, labeled or color-coded container that is closed before removal from the work area.
- All activities involving potentially infectious materials will be conducted in biological safety cabinets or other physical containment devices within the laboratory.
- Laboratory coats, gowns, smocks, uniforms, or other appropriate protective clothing will be used in the work area and animal rooms. Protective clothing will not be worn outside the work area and will be decontaminated before being laundered.
- Special care will be taken to avoid skin contact with potentially infectious materials. Gloves will be worn when handling infected animals and when making hand contact with potentially infectious materials is unavoidable.
- A facility for hand washing and an emergency eyewash station will be readily available within the work area. An autoclave will be available within the work area for the decontamination of biohazardous waste.
- Vacuum lines will be protected with liquid disinfectant traps and high efficiency particulate air (HEPA) filters or filters of equivalent or superior efficiency and that are checked routinely and maintained or replaced as necessary.

- Hypodermic needles and syringes will be used only for parenteral injection and aspiration of fluids from laboratory animals or diaphragm bottles. Only needle-locking syringes or disposable syringe-needle units will be used for injection or aspiration of other potentially infectious materials. Extreme caution will be used when handling needles and syringes. Needles will not be bent, sheared, replaced in the sheath or guard, or removed from the syringe following use. The needle and syringe will be promptly placed in a puncture-resistant container and routed as waste to an incinerator.
- All spills will be immediately contained and cleaned up by appropriate professional staff or others properly trained and equipped to work with potentially concentrated infectious materials. A spill or accident that results in an exposure incident will be immediately reported to the laboratory director or other responsible person. See Appendix B Biohazard Spill Response SOP.
- All activities or procedures with potentially infectious materials that pose a threat of exposure to droplets, splashes, spills or aerosols require a combination of personal protective equipment and primary containment such a respirator and biological safety cabinet, or special protective clothing and containment caging for animals. Biological safety cabinets will be certified when installed, when moved, and at least annually.

HIV and HBV Production Facilities, in particular, will meet the following criteria:
- The work areas will be separated from areas in the building that are open to unrestricted traffic.
- Passage through two sets of doors will be required for entry into the work area from access corridors or other contiguous areas.
- Access doors to the work area will be self-closing.
- The surfaces of doors, walls, floors, and ceilings will be water resistant to that they can be easily cleaned.
- Penetrations in these surfaces will be sealed or capable of being sealed to facilitate decontamination.
- The sink for hand washing will be foot, elbow, or automatically operated and will be located near the exit door of the work area.
- The facility will be serviced by a ducted exhaust-air ventilation system. The system will create directional airflow that draws air into the work area through the entry area. The exhaust air will not be recirculated to any other area of the building, will be discharge to the outside, and will be dispersed away from occupied areas and air intakes. Qualified ventilation engineers will verify the proper direction of the airflow in the work area.

Personnel who work in HIV and HBV Research Laboratories and Production Facilities will receive special training in addition to that required for employees who do not specifically handle known pathogenic agents.

This extra training, detailed in Section VII of the Exposure Control Plan, will cover the following areas:
- proficiency in standard & special microbiological practices
- prior experience in handling human pathogens
- training program for employees with no prior experience
- initial activities do not involve pathogens
- progression of activities as proficiency develops
- infectious agents handled only after proficiency is shown

G: HEPATITIS B IMMUNIZATION PROGRAM

POLICY

One major bloodborne infectious disease, Hepatitis B, is entirely preventable through immunization. Employees must be offered immunization at the time they begin working with human blood or OPIM. The department or research laboratory must cover the cost of the elective vaccination series, administered through UHS.

PROCEDURE

- Immunization against Hepatitis B virus (HBV) by means of a vaccination series will be made available, by the supervisor, to all employees who are determined to be "occupationally-exposed."
- Employee participation in the vaccination series will be on a completely voluntary basis and will be provided at no cost to them.
    - Although the vaccine is recommended, there will be no negative consequences to any person who chooses not to participate in the immunization program, for any reason.
- The employee may choose to accept the vaccination series, decline, or have the opportunity to discuss vaccination series with a clinician and have a HBV titer check.
- The Immunization Program consists of a series of two or three intramuscular vaccinations administered at times zero, one month and six months.
    - Vaccination will be made available by the supervisor within 10 working days of initial employee assignment; and after the employees have been given information on the HBV vaccine efficacy, safety, method of administration, the benefits of immunization, and that the vaccination series will be offered free of charge.
    - Although, follow-up serology testing is not necessary after immunization – lifetime immunity has been documented, the employee may choose to confirm immunity through an antibody titer at UHS.
- If the employee consents to participate in the Immunization Program, the vaccinations will be offered at a time and place convenient to the employee.
- If the employee has previously received the complete HBV vaccination series and/or antibody testing has revealed that the employee is immune or the vaccine is contraindicated for medical reasons, the vaccination series will not be offered.
- If an occupationally exposed employee chooses not to participate in the immunization program, he/she is required to document the declination with a special form, included as Appendix A in this policy. A copy of this form must be retained by the Supervisor or Primary Investigator.
    - It is recommended that the immunization program and request/declination forms be discussed annually during the Blood Borne Pathogens training.
- If the employee initially declines to participate in the HBV immunization program, but at a later decides to become immunized, the vaccination series will be made available at that time.
- HBV vaccinations will be provided at the UHS.

H: POST-EXPOSURE EVALUATION AND FOLLOW-UP

POLICY

All occupational exposures to human blood or OPIM will be regarded as serious, reported promptly, evaluated by a trained healthcare professional, and treated accordingly.

PROCEDURE

- Upon injury from a suspected exposure source, the employee will attempt to determine the nature of the exposure and any biohazardous material associated with it.
- The employee will also attempt to carefully retain the exposure source and any biohazardous materials that may have constituted an exposure.
- If necessary, first-aid should be administered immediately for any cuts or punctures and any exposed skin should be washed with soap and water. The employee should report the injury to their responsible supervisor within the hour.
- The responsible supervisor will assess the situation and determine if the incident constitutes an occupational exposure to a biohazardous material. The responsible supervisor will then locate and complete any necessary accident forms and refer the employee to the University Health Services.
- If the injury is received during normal work hours, the employee will present at University Health Services as soon as possible and report that they have received an occupational injury of a potentially infectious nature. If the supervisor has completed the "Employee Injury Report" it should be sent with the employee or faxed to University Health Services when completed. If the employee arrives before injury report, University Health Services will contact the employee's supervisor for a verbal referral.
- Persons with exposure injuries after hours or on weekends or holidays must report immediately to Stillwater Medical Center (SMC) for medical evaluation and treatment. The employee must inform SMC that they are OSU faculty/staff personnel and have received an occupational injury of a potentially infectious nature.
- The employee will provide details on their injury to the occupational medical physician:
  - the type of injury the employee received
  - the type and samples of any biohazardous material the employee was exposed to
  - circumstances under which the exposure occurred
  - the hepatitis immunization status of the employee
- The physician will provide the employee with a confidential medical evaluation and follow-up of the incident:
  - evaluation of the exposure risk of the incident based on the exposure source
  - providing the employee with a written list of recommended options for testing and preventative treatment
  - explaining to the employee the rationale and benefits of these tests and treatments.
- **Testing options include:** Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and Human immunodeficiency virus (HIV) antibody testing of any samples of biohazardous material to which the employee was exposed, and base-line testing of an employee blood sample for Hepatitis B & C and HIV Ab for determination of pre-exposure status.
- **Preventative treatment options include:** Hepatitis B immunoglobulin (H-BIG) - protective antibody product for short-term protection and HBV immunization for long-term protection against HBV. For the preventative treatments to be most effective the H-BIG must be given within 24 hours of exposure. Depending on the circumstances of exposure, oral anti-viral medication may be given per CDC guidelines.
- Employee acceptance of these tests/treatments will be on a completely voluntary basis and services will be provided at no cost to them.
- The medical provider will provide the University with a written opinion (physician's determination), within 7 days of the exposure incident. The report will summarize:
  - That the employee has been informed of the results of the evaluation and has been told about any medical conditions resulting from exposure to blood or other biohazardous materials that require further evaluation and treatment
  - Whether HBIG or HBV vaccination series, oral antiviral medication, or other treatment options were made available to the employee
  - All other findings or diagnoses will remain confidential and will not be included in the report
- The University will provide the employee a copy of the physician's determination within 15 days of the exposure incident. A copy of the report will be included in the employee's permanent medical records with the University.

- If the employee eventually becomes ill or seroconverts (develops antibodies to the virus) as a direct result of occupational exposure to a bloodborne pathogen, the medical provider will file a complete report with Human Resources, which handles Worker's Compensation.
- The report will be confidential and will be sent to no other organization within the University.
- If the exposure source sample is positive or not available and the employee is negative for HBV, HCV, and HIV, follow up testing will be made available to them at 3 months and 6 months.
- If occupational exposure of the employee to a bloodborne pathogen is confirmed, the University shall provide, through the healthcare service, confidential counseling and evaluation of any consequent illness that the employee reports for a period of up to 6 months.

I: COMMUNICATION OF HAZARDS TO EMPLOYEES

POLICY

Employees must be informed of the risks associated with the human blood and body substances they use, and required precautions they must follow to protect themselves and fellow workers. Labels, signs, and other written information assure that employees are aware of the hazardous materials in their workplace. Use of this information and precautions will reduce the risk of employee exposure to bloodborne pathogens.

PROCEDURE

Labels and Signs

- Warning labels must be affixed to or printed on containers and bags of biohazardous waste, refrigerators, freezers, and other containers used to contain, store, or transport blood or other potentially infectious materials (OPIM).
- Labels must include the internationally recognized biohazard logo and the word "biohazard."
- Labels must be affixed at a conspicuous location on the container by direct print or adhesive.
- Contaminated equipment must be labeled as biohazardous and indicate which parts are contaminated.
- Biohazardous waste that has been decontaminated by steam sterilization must have a positive indication of safety. Printed-on sterilization indicator on the autoclave bag accomplishes this. (e.g., Fisher brand #01-826A-E series autoclave bags).
- Signs that include the internationally recognized biohazard logo and the word "biohazard" will be posted at the entrance of HIV and HBV research laboratories and production facilities.
- OSHA mandates that the label used to communicate biological hazards will include the appropriate legend in fluorescent orange/orange-red with the letters in a contrasting color.

FIGURE 1: CORRECT BIOHAZARD SIGNAGE

Information and Training

- The supervisor, PI or laboratory manager will ensure that all employees with occupational exposure, including themselves, participate in a training program that must be provided during working hours.
- The training will be provided at the time of initial assignment and at least annually thereafter.

- The supervisor, PI or laboratory manager will ensure that additional training is provided when changes such as modification of tasks or institution of new procedures affect employees' occupational exposure.
- BBP training is provided by EHS and covers basic risks and prudent practices to avoid occupational exposure:
  - **Bloodborne Pathogens Standard** - purpose, policy and responsibilities
  - **Modes of transmission, epidemiology, and symptomatology** of bloodborne diseases
  - **Exposure Control Plan** - means by which the employee may obtain a copy of the document
  - **Tasks and other activities that may involve exposure** to blood and other potentially infectious materials
  - **Methods that will prevent or reduce exposure** - including appropriate engineering controls, work practices, and personal protective equipment
  - **Personal protective equipment** - types, selection, proper use, storage location, removal, handling, decontamination and disposal.
  - **Hepatitis B immunization program** - including information on the efficacy, safety, administration, and benefits of the vaccine and that the vaccine will be offered at no cost to the employees
  - **Appropriate actions** to take and persons to contact in an emergency
  - **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
  - **Post-exposure evaluation and follow-up** that the department is required to provide for the employee following an exposure incident
  - **Labels, signs and color-coding pertaining to biohazards** required by departmental policy
  - **Opportunity for interactive questions** and answers with the person conducting the training session
- The supervisor, PI or laboratory manager must also instruct employees on the site-specific risks and safety procedures for their assigned research tasks.

J: RECORDKEEPING

POLICY

OSHA requires detailed recordkeeping for the responsible supervisor and the university. For the Bloodborne Pathogens Standard to be effective, records must be maintained and kept following the below requirements.

PROCEDURE

Medical Records

UHS maintains accurate records for each employee with occupational exposure. These records include:

- Name and campus wide identification number (CWID)
- A copy of the employee's hepatitis B immunization status including the dates of all the hepatitis B vaccinations and any medical records relative to the employee's ability to receive vaccination
- A copy of all results of examinations, medical testing, and exposure incident follow-up procedures
- A copy of the physician's written opinion concerning hepatitis B vaccination and post-exposure evaluation and follow-up

The University will ensure that the employee medical records are kept confidential and are not disclosed or reported without the employee's express written consent to any person within or outside the workplace except as required by availability provisions the Occupational Safety and Health Act.

The University, through UHS, will maintain the employee medical records for at least the duration of employment plus 30 years.

Training Records
Training records for basic training in Bloodborne Pathogens given by EHS will be maintained at EHS and a copy provided to the section. Responsible supervisors are responsible for keeping a copy of the training record in the laboratory/workplace.

Training records for site-specific training on laboratory procedures must be maintained by the laboratory manager, and must include:

- Dates of the training
- Contents or a summary of the training
- Names of persons conducting the training
- Names and job titles of all persons attending the training sessions

The University will maintain all training records for a period of 3 years after the training occurred.

Vaccination/Declination Records (Appendix A)
Vaccination records will be maintained by UHS. Declination forms will be maintained by the supervisor, PI or laboratory manager and will be accessible for review by EHS or any Federal or State agency if required.

Availability
The University must ensure that all medical records will be provided upon request for examination and copying to the subject employee and to anyone having written consent of the subject employee within 15 working days. The supervisor, PI or laboratory manager will ensure that all training records are provided upon request for examination and copying to employees and to employee representatives within 15 working days.

Sharps Injury Log (Appendix D)
An exposure incident is evaluated to determine if the case meets OSHA's Recordkeeping Requirements (29 CFR 1904). This determination and the recording activities are done by _____ (individual or department).

In addition to the 1904 Recordkeeping Requirements, all percutaneous injuries from contaminated sharps are also recorded in the Sharps Injury Log, Appendix D. All incidences must include at least:

- Date of the injury
- Type and brand of the device involved
- Department or work area where the incident occurred
- An explanation of how the incident occurred.

This log is reviewed at least annually as part of the annual evaluation of the program and is maintained for at least five years following the end of the calendar year that they cover. If a copy is requested by anyone, it must have any personal identifiers removed per HIPAA regulations.

Needlestick and Sharps Safety
The responsible supervisor who has employees with direct contact must consider and use effective engineering controls, including safety sharps devices or needleless systems for withdrawing body fluids, accessing a vein artery, or administering medications/other fluids, in order to reduce the risk of injury from needlesticks and from other sharp medical instruments. This includes:

- Establishing a program for evaluating safety sharps devices designed to eliminate or minimize occupational exposure;
- Annually reviewing sharps that are being used; and
- Identifying all sharp devices that have available products with safety engineering features and determining which products must be evaluated (Table 4). The evaluation committee must include non-managerial and managerial personnel.

TABLE 4: Needlesticks/Sharps Evaluation Evaluation Committee	
Name	**Job Title/Description**

Sharp Product		**Safety Device Available/Acceptable**	**Date Evaluated**
Syringe			
Scalpels			
IV access device			
IV medication connectors			
Vacuum tube collection system			
Lancets			
Capillary tubes			
Other:			
Other:			

K: REFERENCES AND RESOURCES

- OSHA Bloodborne Pathogens Standard (29 CFR 1910.1030)
- University of Michigan ECP
- Iowa State Bloodborne Pathogens Manual
- University of Louisville Bloodborne Pathogens Model Exposure Control Plan
- Guide to Infection Prevention in Emergency Medical Services by the Association of Professionals in Infection Control and Epidemiology
- Sherris Medical Microbiology (5th Edition) by Kenneth J. Ryan and C. George Ray
- Medical Microbiology (8th Edition) by Patrick Murray, Ken Rosenthal, and Michael Pfaller
- Control of Communicable Diseases Manual by David L. Heymann