# BLOODBORNE PATHOGEN EXPOSURE CONTROL PLAN

## FOR LABORATORIES

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REGULATION

The Occupational Safety and Health Administration (OSHA) has determined that certain employees face a significant health risk as the result of occupational exposure to blood and other potentially infectious materials as they may contain bloodborne pathogens. OSHA concluded that this exposure could be minimized or eliminated using a combination of engineering and work practice controls, personal protective clothing and equipment, training, medical surveillance (including the Hepatitis B vaccination), signs and labels, and other provisions. The OSHA Bloodborne Pathogen (BBP) standard, 29 CFR 1910.1030, became effective on March 6, 1992 and was amended with the Needlestick Prevention Act on January 18, 2001. A copy of the standard is available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051.

The standard requires that each employer develop a written **Exposure Control Plan** designed to eliminate or minimize employee exposure to bloodborne pathogens. This document is the UNC's Exposure Control Plan for laboratory employees. This document must be made available to each employee identified as having occupational exposures to blood or other potentially infectious materials. Compliance with the Exposure Control Plan is a condition of employment for all employees with occupational exposures.

DEFINITIONS

1) **Blood**: Human blood, human blood components, products made from human blood

2) **Bloodborne pathogens**: Pathogenic microorganisms that are present in human blood and can cause disease in humans. Include, but are not limited to, hepatitis B virus (HBV), human immunodeficiency virus (HIV)

3) **Occupational Exposure**: reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials (defined below) that may result from the performance of an employee's duties.

4) **Other Potentially Infectious Materials (OPIM)**:
   A. Certain human body fluids
      a. Semen
      b. Vaginal secretions
      c. Cerebrospinal fluid
      d. Synovial fluid
      e. Pleural fluid
      f. Pericardial fluid
      g. Peritoneal fluid
      h. Amniotic fluid
      i. Saliva in dental procedures
      j. Any body fluid visibly contaminated with blood
      k. All body fluids when it is difficult to differentiate between body fluids
   B. Any unfixed tissue or organ from a human, living or dead; and
C. 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.

D. Human cell lines.

EXPOSURE DETERMINATION

Laboratory Principal Investigators are required to determine which employees in their work area have occupational exposure to blood or other potentially infectious materials and which tasks and procedures conducted in the laboratory may result in occupational exposure. This determination must be made without regard to the use of PPE. Employees that have been identified as having occupational exposure must indicate this on the Laboratory Worker Registration form found at https://itsapps.unc.edu/LabRadWorker/.

Laboratory employees covered by the Bloodborne Pathogen standard are those with job duties that require contact or manipulation of blood or other potentially infectious materials. Recognition of tasks with exposure risks enables one to utilize engineering and work practice controls and to choose the proper personal protective equipment, which will eliminate or minimize exposure to blood and other potentially infectious materials. Some laboratory tasks with exposure risks include manipulation of contaminated sharps or glass equipment or waste and procedures that could possibly produce sprays and splatters of blood or potentially infectious materials (centrifugation, pipetting, opening tubes). See Appendix A for a list of job classifications identified as having potential exposure.

UNIVERSAL PRECAUTIONS

All human blood and certain body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens. In general, under the OSHA Bloodborne Pathogens Standard, universal precautions are to be observed to prevent contact with blood or "other potentially infectious materials". With Universal Precautions, individuals should wear PPE when they anticipate coming into contact with blood, blood products, certain body fluids and any body fluids visibly contaminated with blood.

EPIDEMIOLOGY

Many diseases are linked to bloodborne pathogens, but few bloodborne pathogens are frequently responsible for infections in the workplace. Important diseases associated with occupational exposure to bloodborne pathogens include hepatitis B, hepatitis C and AIDS. Historically, work-related exposure incidents occur much more often in occupations that require direct contact with patient, however instances have occurred where an infection was acquired while cleaning up a spill of potentially infectious material. Only workers with documented training in bloodborne pathogens should handle the clean-up of this type of spill. As part of this training, the worker should know some basic concepts about these diseases so that s/he can discuss them with a supervisor, family members, and a physician.
**Hepatitis B virus.** Between two thirds and three fourths of all Hepatitis B infections result in either no symptoms of infection or a relatively mild flu-like illness. Between 25% and 33% of the infections, however, take a much more severe clinical course. The symptoms include jaundice, dark urine, extreme fatigue, anorexia, nausea, abdominal pain, and sometimes joint pain, rash, and fever. Hospitalization is required in about 20% of the more severe clinical cases.

A safe, immunogenic, and effective vaccine to prevent hepatitis B has been available since 1982 and is recommended for employees with the potential for occupational exposure to blood and other body fluids.

**Hepatitis C virus** is the most frequently occurring bloodborne pathogen infection. At least 85% of persons with Hepatitis C Virus (HCV) infection become chronically infected, and chronic liver disease develops in an average of 67%. HCV is most efficiently transmitted by large or repeated percutaneous exposures to blood, such as through the transfusion of blood or blood products from infected donors and sharing of contaminated needles among injection drug users. Other bloodborne viruses, such as HBV, are transmitted not only by percutaneous exposures, but also by mucous membrane and apparent parenteral exposures.

One case of transmission of HCV from a blood splash to the conjunctiva was reported for a health care worker.

**Human immunodeficiency virus.** HIV stands for human immunodeficiency virus. HIV is the virus that causes AIDS (acquired immunodeficiency syndrome), the final stage of HIV infection. HIV adversely affects the immune system rendering the infected individual vulnerable to a wide range of clinical disorders. These conditions, some of which tend to recur, can be aggressive, rapidly progressive, difficult to treat, and less responsive to traditional modes of treatment. They usually lead to the death of the HIV infected patient. The CDC has divided disease progression into four stages, grouped according to infections or symptoms reported.

**Group I:** Within a month after exposure, an individual may experience acute retroviral syndrome, the first clinical evidence of HIV infection. This is a mononucleosis-like syndrome with signs and symptoms that can include fever, lymphadenopathy, myalgia, arthralgia, diarrhea, fatigue, and rash. Acute retroviral syndrome is usually self-limiting and followed by the development of antibodies.

**Group II:** Although most persons infected with HIV develop antibodies to the virus with 6-12 weeks after exposure, most of these individuals are asymptomatic for months to years following infection. However, they can transmit the virus to others throughout this time.

**Group III:** Although no other signs or symptoms are experienced, some HIV-infected patients will develop a persistent, generalized lymphadenopathy that lasts more than 3 months.

**Group IV:** Epidemiologic data indicates that most persons who are infected with HIV will eventually develop AIDS. AIDS can result in severe opportunistic infections that an individual with a normal immune system would only rarely experience, as well as a wide range of neurologic and oncogenic or neoplastic processes. Some patients may experience “constitutional disease” also known as HIV “wasting syndrome,” which may be characterized by severe, involuntary weight loss, chronic diarrhea, constant or intermittent weakness, and fever for 30 days or longer. This syndrome may result in death. Individuals with AIDS may also develop HIV encephalopathy, dementia, myelopathy or peripheral neuropathy. In addition, the virus is capable of affecting the peripheral nervous system causing severe pain and weakness or numbness in the limbs. There are specific diseases considered indicators of AIDS. Among these are parasitic diseases such as *Pneumocystis carinii* pneumonia; fungal diseases
such as candidiasis of esophagus, trachea, bronchi or lungs; viral diseases such as
cytomegalovirus disease of an organ other than the liver, spleen or lymph nodes;
cancer/neoplastic diseases such as Kaposi's sarcoma; and bacterial infections such as
*Mycobacterium avium* complex.

HIV is a fragile virus. It cannot live for very long outside the body. Reports dealing with HIV
infection indicate that the risk of bloodborne transmission from inadvertent exposure is
considerably less for HIV than for HBV infection.

HIV can enter the bloodstream the same as HBV: if potentially infectious materials (like blood)
come into contact with an unprotected break in your skin such as an open wound, acne, rash, etc.
or if you experience a splash into your eyes and/or nose. The risk of getting an HIV infection
like this is considerably less for HIV than for HBV infection. The occupational risk of acquiring
HIV like this is 1 in 200 compared with 1 in 33 for HBV.

As a properly trained UNC employee, when you handle any material that you suspect is infected
with bloodborne pathogens, keep this information in mind. It will help you understand the
importance of the following sections in this document.

**FACILITIES AND PRACTICES**

All work with human blood or OPIM must be conducted at BSL2 as described in Biosafety in
Microbiological and Biomedical Laboratories (5th edition) [http://www.cdc.gov/od/ohs/biosfty/bmbl5/bmbl5toc.htm](http://www.cdc.gov/od/ohs/biosfty/bmbl5/bmbl5toc.htm). BSL2 is for work involving agents of
moderate potential hazard to personnel and the environment. BSL2 requires that laboratory
personnel have specific training in handling pathogenic agents and are directed by competent
scientists. Access to the BSL2 laboratory is limited when work is being conducted, extreme
precautions are taken with contaminated sharp items and certain procedures in which infectious
aerosols or splashes may be created are conducted in biological safety cabinets or other physical
containment equipment. If you are working at BSL2 you are required to take the online BSL2
training. It can be found at [http://ehs.unc.edu/training/self_study/bsl2/](http://ehs.unc.edu/training/self_study/bsl2/)

**ENGINEERING CONTROLS**

Engineering Controls specifically isolate or remove a bloodborne pathogen hazard from the
workplace.

- Engineering controls used at the University include sharps disposal containers, safer needle
devices and biological safety cabinets:

**Sharps disposal containers.** Sharps containers must be easily accessible and located near areas
where sharps are used. The containers must be red, puncture-resistant, leak-proof and display a
BIOHAZARD label. These containers must be maintained upright, must not be overfilled, must
be closed prior to removal and must not be opened, emptied or cleaned manually. In UNC-CH
research laboratories, sharps are collected directly into red, plastic sharps containers available from
[www.fishersci.com](http://www.fishersci.com).
The appropriate caution labels can be found for biohazardous sharps at: (http://ehs.unc.edu/ih/lab/labels/docs/biohaz_needles.pdf), non-hazardous sharps (http://ehs.unc.edu/ih/lab/labels/docs/non_haz_needles_sharps.pdf).

The use of sharps containers for glass Pasteur pipette disposal has caused safety concerns, particularly in biological safety cabinets designated at BSL-2. Overfilling of the container has been found to result in an increased risk of sharps exposure; which, the prudent reduction of, is mandated under the OSHA Bloodborne Pathogens Standard. An acceptable disposal alternative in biological safety cabinets designated at BSL-2 is an item such as Whitney Products Pipet Keeper available at www.fishersci.com web as item # 14-375-268.

**Safer needle devices.** If there is no alternative to using a needle for a laboratory procedure (i.e. injection into animals), the use of safer needle devices should be considered. Protective devices include those that have a built-in safety feature or mechanism and “needleless systems” that effectively reduce the risk of an exposure incident. Some examples of safer devices (including animation of how they work) can be found on the OSHA website at http://www.osha.gov/SLTC/etools/hospital/hazards/sharps/sharps.html#Safer

**Biological safety cabinets.** Biological safety cabinets must be used when conducting procedures with a potential for creating aerosols or splashes of blood/OPIM. These procedures include:

A. Centrifuging (note: if centrifuge has sealed rotor heads or safety cups, centrifuging can be conducted outside of the cabinet, provided that the rotor heads and safety cups are opened in the cabinet)

B. Grinding, blending, vigorous shaking or mixing

C. Sonic disruption

D. Opening containers whose internal pressures differ from ambient
E. Inoculating animals intra-nasally
F. Harvesting infected tissues from animals or embryonate eggs
G. Conducting experiments with high concentrations or large volumes (greater than 10 liters).

Improper use of biological safety cabinets can lead to loss of containment (and potential exposure to infectious material) and contamination of experiments. The following practices should be followed when using the biological safety cabinet:
   A. Decontaminate work surfaces before and after use
   B. Use only materials needed for procedures
   C. Arrangement of clean and contaminated items
   D. Limit movement in and out of the cabinet, it disrupts the air barrier
   E. No flame burners
   F. Minimize room air currents from walking near cabinet, opening doors, room air vents
   G. Pipettes should be disposed of in a horizontal tray filled with disinfectant inside the cabinet or a small biohazard bag inside the cabinet. Do not use a container outside of the cabinet. Moving your hands in and out of the cabinet disrupts the air barrier and could lead to contamination outside of the cabinet or exposure.

Engineering controls must be maintained on a regular schedule. It is recommended that biological safety cabinets be certified annually when used for human blood or OPIM. To have a cabinet certified, contact EHS (962-5507).

WORK PRACTICE CONTROLS

These are controls that reduce likelihood of exposure by altering the manner in which a task is performed.

**Hand washing.** Hands and any other contaminated skin are to be washed with soap and water immediately or as soon as feasible following contact of such body areas with blood or other potentially infectious materials. Hand washing facilities must be readily accessible and should be located within the laboratory where the blood/OPIM is used. Hands are to be washed immediately or as soon as feasible after removal of gloves or other personal protective equipment.

**Sharps Precautions.** These precautions apply to any contaminated object that can penetrate the skin, including needles, scalpels and glass objects.

   A. **Contaminated needles.** Contaminated needles are not to be bent, broken, recapped, or removed, unless it can be demonstrated that no alternative is feasible. When necessary, recapping or needle removal must be accomplished through the use of a mechanical device or a one-handed technique.

   Immediately or as soon as possible after use, contaminated reusable sharps must be placed in a puncture-resistant container. Contaminated disposable needles are to be placed in sharps containers described above and autoclaved before disposal.
B. **Broken glassware** which may be contaminated should not be collected directly with the hands. Wear gloves and use mechanical means, such as a brush and dust pan, tongs, or forceps. If the glassware is biohazardous, it should be collected in a glass box, lined with an orange

**Prevent Ingestion.** Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is reasonable likelihood of occupational exposure. For more information, refer to Chapter 3 of the UNC Laboratory Safety Manual

Storage of food and drink is prohibited in refrigerators, freezers, shelves, cabinets or on countertops or bench tops where blood or other potentially infectious materials are present.

Mouth pipetting/suctioning of blood or other potentially infectious materials is prohibited. Mechanical pipetting devices must be used.

**Minimize Splashing.** All procedures involving blood or other potentially infectious materials must be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.

**Labels.** **BIOHAZARD** warning labels are posted when there is a chance that germs, including bloodborne pathogens, may be present. Common places these labels are found are on freezers, incubators, centrifuges, biological safety cabinets, waste containers, etc. which are used with blood or other potentially infectious material; and other containers used to store, transport or ship blood or other potentially infectious materials. According to OSHA, **BIOHAZARD** warning labels must include the following legend: Universal Biohazard Symbol, and be fluorescent orange or orange-red with lettering or symbols in a contrasting color. Labels are affixed as close as feasible to the container by string, wire, adhesive, or other method that prevents their loss or unintentional removal.

**Specimen Containers.** Specimens of blood or other potentially infectious materials are to be placed in a closed container, which displays a **BIOHAZARD** warning label and prevents leakage during collection, handling, processing, storage, transport, or shipping. If the specimen could puncture the container or if outside contamination of the primary container occurs, the primary container is to be placed within a second closable, labeled, leak-proof container.

**Contaminated Equipment.** All equipment (i.e. freezers, refrigerators, centrifuges, etc.) potentially contaminated with blood or OPIM must be labeled with the biohazard warning symbol. Contaminated equipment must be decontaminated with an EPA registered tuberculocidal disinfectant or a solution of 5.25 percent sodium hypochlorite, (household bleach), diluted between 1:10 and 1:100 with water prior to servicing or shipping. Portions of the equipment not feasible for decontamination are to be designated with a **BIOHAZARD** warning label and the information must be communicated to service personnel.
PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) is specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (including uniforms) are not PPE. Whenever there is the potential for occupational exposure, personal protective equipment such as gloves, gowns, laboratory coats, face shields or masks and eye protection must be available and utilized. Personal protective equipment in the appropriate sizes is to be readily accessible at the worksite or issued to employees. If a garment(s) is penetrated by blood or other potentially infectious materials, the garment(s) must be removed immediately or as soon as feasible.

All personal protective equipment must be removed and placed in a designated container (for storage, decontamination, or disposal) prior to leaving the work area. PPE must not be worn outside of the laboratory area. Gloves must be removed prior to leaving the laboratory. DO NOT wear gloves on elevators or use them to open doors or touch equipment (i.e. phones, computers) that others will be handling without gloves.

The minimum PPE required for handling blood/OPIM in laboratories is gloves, safety glasses (or goggles) and lab coats. Additional PPE such as surgical masks or face shields may be required for procedures with high probability for splashing.

Gloves. Gloves are to be worn when it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, and non-intact skin; and when handling or touching contaminated items or surfaces. Disposable (single use) gloves such as surgical or examination gloves must 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 (single use) gloves are not to 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, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised. Hypoallergenic gloves, glove liners, powder less gloves, or other similar alternatives are to be readily accessible to those employees who are allergic to the gloves normally provided.

Masks, Eye Protection, and Face Shields. Masks in combination with eye protection devices such as goggles or glasses with solid side shields, or chin-length face shields, are to be worn whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated. Regular prescription glasses are not considered eye protection and safety glasses, goggles or face shields must be worn over these glasses.

Lab coats, Gowns, Aprons, and Other Protective Body Clothing. Appropriate protective clothing such as, but not limited to, lab coats, gowns, aprons, or similar outer garments are to be worn in occupational exposure situations. The type and characteristics will depend upon the task.
and degree of exposure anticipated. Your Principal Investigator will determine which PPE is appropriate for the work that you perform.

**HOUSEKEEPING**

Laboratories are to be maintained in a clean and sanitary condition. An appropriate written schedule for cleaning and method of decontamination are to be determined and implemented, based upon the location within the facility, type of surface to be cleaned, and tasks or procedures being performed in the area.

All equipment and work surfaces are to be cleaned and decontaminated with an appropriate disinfectant after completion of procedures, or, immediately after spills. Suitable disinfectants include those that are tuberculocidal (e.g. Vesphe, OMNI II Disinfectant) or a solution of 5.25% sodium hypochlorite (household bleach) diluted to 1:10 to 1:100 with water. Fresh solutions of diluted household bleach must be made daily (every 24 hours).  

OSHA Instruction CPL 2-2.69  

Protective coverings, such as plastic wrap, aluminum foil, or imperviously-backed absorbent paper used to cover equipment and environmental surfaces, are to be removed and replaced as soon as feasible when they become overtly contaminated or at the end of the work shift if they may have become contaminated.

All bins, pails, cans, and similar receptacles intended for reuse which have a reasonable likelihood for becoming contaminated with blood or other potentially infectious materials are to be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.

Contaminated laundry is to be handled as little as possible. Contaminated laundry must be bagged or containerized at the location where it was used and is not to be sorted or rinsed in the location of use. Contaminated laundry is to be placed and transported in bags or containers labeled or color-coded. Whenever contaminated laundry is wet and presents a reasonable likelihood of soak-through of or leakage from the bag or container, the laundry shall be placed and transported in bags or containers which prevent soak-through and/or leakage of fluids to the exterior. Contaminated clothing or other laundry such as lab coats must not be taken home for cleaning. Personal clothing contaminated with blood or other potentially infectious material will be cleaned by a laundry service with arrangements being made through the employee’s department. Information about laundry services can be found at  
http://ehs.unc.edu/ih/lab/laboratory.shtml  

**Clean-up of blood spills.** Spills may occur when containers of blood or other potentially infectious materials (OPIM) are dropped in the laboratory or may occur when an injured person drips blood on the floor. Employees who are exposed to blood or OPIM are to be thoroughly familiar with emergency and decontamination procedures so that the contamination is contained and exposure of
individuals is minimized. The following procedure is suggested for clean-up of blood spills in research laboratories at UNC:

A. Evacuate the area and allow 30 minutes for aerosols to dissipate prior to spill cleanup.
B. Protective clothing should be worn when entering the spill area. Gloves, safety glasses or goggles, and a lab coat or disposable coveralls should be worn. For spills on the floor, a gown that may trail the floor when bending down should not be worn.
C. Pour disinfectant solution around the spill and allow the liquid to flow into the spill. Paper towels soaked in disinfectant may be used to cover the area. Suitable disinfectants include those that are tuberculocidal or a solution of 5.25% sodium hypochlorite (household bleach) diluted 1:100 with water. To minimize re-aerosolization, avoid pouring the disinfectant solution directly onto the spill. Allow at least 20 minutes of contact time before cleaning up spill.
D. For small liquid spills, wipe up spill with paper towels.
E. For large spills, a bucket with 1:100 dilution of sodium hypochlorite and mop should be used.
F. For large spills or spills containing sharp materials (broken glass, plastic), use a dust pan and squeegee to transfer contaminated materials (paper towels, glass, liquid, etc.) into an orange biohazard bag, tape or tie the bag closed and place in a second orange biohazard bag. Place the dustpan and squeegee in a separate biohazard bag for autoclaving.
G. All potentially contaminated waste and PPE should be placed in biohazard bags for autoclaving.

WASTE DISPOSAL

Regulations and Requirements

The OSHA Bloodborne Pathogens Standard regulates the containment and labeling of blood and certain waste which may be contaminated with blood, as well as needles and other sharps. The North Carolina medical waste rules (15A NCAC 13 B .1200), require that "Regulated Medical Waste", defined as "blood and body fluids in individual containers greater than 20 ml, microbiological waste, and pathological waste,” be treated before disposal in order to render the waste nonhazardous. Primary methods for treating biological waste in UNC-CH campus research laboratories differ from those at UNC Hospitals. All biohazard waste generated on UNC-CH campus must be treated by the lab prior to being transferred by housekeeping staff to an outdoor dumpster, and then transported to the landfill. In contrast, UNC Hospitals incinerates the majority of their biological waste onsite, mostly due to confidentiality issues pertaining to patient samples.

Most UNC-CH campus laboratory generated biohazard waste, as defined above, falls under the State defined category of “microbiological waste” within 15A NCAC 13 B .1200. Critical elements of UNC-CH Campus Biological Waste Disposal policy are described below. The most commonly used effective treatment method for research laboratories under this policy is steam disinfection (autoclaving). Only by following these requirements can the perception and the fact of biosafety be achieved, from the laboratory worker generating the waste to the UNC support staff treating and transferring the waste to the landfill employees hauling and burying the waste.

http://ehs.unc.edu/ih/biological/infectious_waste.shtml
**Definition of Laboratory Generated Biohazard Waste**

Biohazard waste at UNC-CH includes potentially infectious material such as blood and body fluids, cell lines (primary and established) and waste contaminated or potentially contaminated from research and teaching activities requiring containment at biosafety levels (BSL) 1, 2, or 3, or animal or plant BSL 1, 2, or 3. Biohazard waste also includes materials contaminated or potentially contaminated during the manipulation or clean-up of material requiring BSL 1, 2, or 3 such as disposable culture dishes, devices used to transfer, inoculate, and mix cultures, liquid or solid media and collection flasks, gloves, pipettes, sharp items and animal carcasses and bedding. Biohazard waste originating from designated BSL-2 or greater containment areas must indicate type of material (agent, toxin, rDNA, etc.) on the Schedule F (Biological Hazards) section of the Laboratory Safety Plan. Laboratories with biohazard wastes not specifically addressed by this document (such as waste with multiple hazards, e.g. chemical or radioactive biohazard waste) should consult with EHS for alternative treatment and disposal methods.

**Biohazard Waste Collection Methods**

Refer to the chart below for a snapshot of the four most common biohazard waste collection methods. This chart is available full size on the EHS biosafety website at [http://ehs.unc.edu/ih/biological/docs/disposal_chart.pdf](http://ehs.unc.edu/ih/biological/docs/disposal_chart.pdf). These methods are described in greater detail in the UNC Biohazard Waste Policy (available online at [http://ehs.unc.edu/ih/biological/infectious_waste.shtml](http://ehs.unc.edu/ih/biological/infectious_waste.shtml)). For Contaminated animal carcasses, body parts, and bedding, refer to that particular section below for disposal guidance.
**Contaminated Sharps.** Sharps include items such as razor blades, scalpels, lancets, syringes with/without needles, slide covers, and specimen tubes. Puncture resistant plastic containers used to collect sharps contaminated under the definition of biohazard waste (above) must bear the biohazard symbol marked with an “x” using autoclave indicator tape. The Bloodborne Pathogens standard requires laboratories to minimize their use of sharps whenever possible and that needles are not to be recapped, purposely bent, broken, or otherwise manipulated by hand. To avoid accidents related to overfilling the containers, remove the containers for treatment or disposal when they are 2/3 full. Containers of contaminated sharps are to be autoclaved. After autoclaving, ensure the containers are capped tightly prior to disposal for removal by housekeeping. New labels are available on the EHS website at [http://ehs.unc.edu/ih/lab/labels/](http://ehs.unc.edu/ih/lab/labels/).

**Research Lab/Clinic Pipetting.** For large-scale collection of Glass (Pasteur) and plastic pipettes contaminated under the definition of biohazard waste (above), line a puncture resistant outer container (such as the package the pipettes came in) with an orange autoclave bag. To avoid handling a bag full of pipettes, place the indicator tape “x” over the bag’s biohazard symbol prior to loading the bag with pipettes. The hard walled outer container itself should bear a biohazard symbol marked with autoclave tape. For frequently removed small scale collection (such as sterile pipetting in a biological safety cabinet), line a
small orange autoclave bag inside a long, thin, hard-walled collection container. Plan to fill this container with appropriate disinfectant upon beginning (may require liquid disposal authorization—see [http://ehs.unc.edu/ih/biological/microbio.shtml](http://ehs.unc.edu/ih/biological/microbio.shtml)) or, when finished, loosely close the bag, disinfect the outside of the bag, and transfer it to your larger scale pipette collection container located outside of the cabinet.

Pipette tips are to be collected on the benchtop in a small autoclave bag lining a wire stand or other container bearing the biohazard symbol. Loosely close the bag to allow for steam penetration and place with other solid biohazard waste.

**Contaminated Solids** consist of culture dishes, flasks, Petri dishes, solid waste cultures/stocks from the testing and production of biologicals, gloves, gowns, masks, and other solid material potentially contaminated under the definition of biohazard waste (above). Line a biohazard waste collection container with an orange autoclave bag bearing an indicator tape “x” over the biohazard symbol. The outer waste collection container must red in color with a lid and a biohazard symbol so it will not be mistaken for regular trash by housekeeping. Remove bags at 2/3 full. Never place glass in these containers.

**Liquids.** Biohazard liquids consist of human blood, animal blood, body products, body fluids, liquid growth media, etc. Autoclaved liquid wastes may be discharged directly to the sanitary sewer (in accordance with the University sewer disposal policy). If this is not feasible visit [http://ehs.unc.edu/ih/biological/microbio.shtml](http://ehs.unc.edu/ih/biological/microbio.shtml) to evaluate if chemical treatment of your liquid biohazard waste requires an application for approval to the NC Medical Waste Division. Remember, for disposal of any chemically treated liquid biohazard waste down the sanitary sewer, care is to be taken to avoid splash and the drains are to be flushed with generous amounts of water.

**Contaminated animal carcasses, body parts, and bedding.** Animal carcasses are disposed of through the Department of Laboratory Animal Medicine (966-3111). Animal carcasses and animal body parts from uninfected animals, transgenic animals, animals inoculated with infectious agents, and animal contaminated with carcinogens/chemicals are disposed of by incineration. These materials are to be placed in incineration boxes provided by DLAM. (No needles or other type of metal and no PVC plastic are to be placed in the collection boxes. Use only non PVC plastic bags.) Carcasses contaminated with radioisotopes are picked up by the Department of Environment, Health and Safety.

**HIV AND HBV RESEARCH LABORATORIES**

Research laboratories engaged in the culture, production, concentration, experimentation, and manipulation or HIV and HBV are to carry out their procedures at Biosafety Level 2 with Biosafety Level 3 Practices. This does not apply to clinical or diagnostic laboratories engaged solely in the analysis of blood, tissues, or organs.

The Environment Health & Safety office conducts annual inspections of HIV research laboratories, to ensure adherence to applicable biosafety practices.
Training. Employees working in HIV or HBV research laboratories must be advised of the potential hazards of working with HIV. They are required to read all written procedures and follow all procedures. These employees receive annual training from EHS that includes the Bloodborne Pathogen standard, BSL3 practices, emergency procedures and medical surveillance.

The Principal Investigator is required to ensure that:

A. Employees demonstrate proficiency in standard microbiological practices and techniques and in the practices and operations specific to the facility before being allowed to work with HIV or HBV.

B. Employees have prior experience in the handling of human pathogens or tissue cultures before working with HIV or HBV. A training program must be provided to employees who have no prior experience in handling human pathogens. Initial work activities must not include the handling of infectious agents. A progression of work activities is to be assigned as techniques are learned and proficiency is developed. Employees are to participate in work activities involving infectious agents only after proficiency has been demonstrated.

Work Practices. The following work practices are required for HIV in addition to the work practices described for working with blood and OPIM:

A. Written policies and procedures must be established for access control so that only persons who have been advised of the potential biohazard, who meet any specific entry requirements, and who comply with all entry and exit procedures are allowed to enter the work areas and animal rooms. Access to the lab is restricted to persons authorized by the Principal Investigator.

B. All activities involving HIV must be conducted in a biological safety cabinet and not on the open bench.

C. Closed-front gowns, gloves, safety glasses/goggles and surgical mask must be worn when working with HIV.

D. Vacuum lines (building or vacuum pump) must be protected with liquid disinfectant traps and HEPA filters as shown below. The filter should be dated and changed on a regular schedule (depending on use).

![An in-line HEPA filter such as Product # 09-744-75 available at www.fishersci.com should be in place at biological safety cabinets and wherever media from potentially infectious cell cultures is being drawn off.](image-url)
E. Centrifuge safety cups and/or sealed centrifuge rotors must be used to contain aerosols. These must only be opened inside of the biological safety cabinet.

F. Containment caging is required for animals.

G. Use of needles and syringes must be used only when there is no other alternative, i.e. parenteral injection and aspiration of fluids from animals and diaphragm bottles. Only needle-locking syringes or disposable syringe-needle units can be used for these purposes. Needles cannot be bent, sheared or recapped and must be placed immediately into sharps disposal containers as described above.

H. Spills, accidents and exposures must be reported to the Principal Investigator and EHS.

**Medical Surveillance.** Employees that work with HIV must be offered HIV testing every 6 months.

**Laboratory Facilities.** HIV laboratory facilities must meet, at a minimum, the following requirements:

A. Laboratory doors must be self-closing and must be kept closed when work involving HIV or HBV is in progress. Keycard or combination locks are required to control access to the lab.

B. Signs must be posted at the entrance to work areas in HIV and HBV Research Laboratory and Production Facilities, which shall bear the Universal Biohazard Symbol, the name of the infectious agent, special requirements for entering the area, and the name and telephone number of the laboratory director or other responsible person. These signs are to be fluorescent orange-red or predominantly so, with lettering or symbols in a contrasting color.

C. The HVAC system must create directional airflow from “clean” areas into the laboratory. The exhaust air cannot be recirculated to other areas of the building.

D. A hand washing facility must be available in the laboratory.

E. An eyewash must be available in the laboratory. The eyewash must be tested weekly to ensure proper function and a log of the testing must be maintained.

F. A biological safety cabinet must be available in the laboratory. The cabinet must be certified annually.

G. An autoclave must be available for decontamination of infectious waste.

**HEPATITIS B VACCINATION**

**Hepatitis B Vaccination.** Hepatitis B vaccination must be made available after the employee has received information and training regarding the vaccine and within 10 working days of initial assignment to all employees who have occupational exposure unless the employee has previously received the complete hepatitis B vaccination series (and can provide documentation), antibody testing has revealed that the employee is immune, or the vaccine is contraindicated for medical reasons. Employees who decline to accept hepatitis B vaccination must sign the declination statement in Appendix B. If you decline the vaccination, you can be vaccinated at a later date, free of charge.
The HBV vaccination involves a series of three injections, the second administered one month following the first, and the third administered six months following the second injection. If an employee terminates his/her employment before finishing all three injections, the University is not responsible for providing the remaining injections.

**Procedures for Requesting a Vaccination.** Employees who have the potential for occupational exposures are to obtain their vaccine through the UNC Employee Occupational Health Clinic 145 North Medical Drive. The employee is to call the UNC Employee Occupational Health Clinic (966-9119) to schedule the first appointment. The UNC Employee Occupational Health Clinic will schedule subsequent appointments to complete the vaccination series.

**POST-EXPOSURE PROCEDURES**

An exposure incident is a specific eye, mouth, other mucous membrane, non-intact skin or parenteral contact with blood or OPIM that results from the performance of an employee’s duties. Employees must follow the procedures listed below if an exposure incident occurs.

**Percutaneous exposure (needle sticks, cuts, animal bites or scratches).** Remove contaminated gloves and if possible, allow the wound to bleed freely for a minute. Wash the wound with soap and water for 5 minutes and apply sterile gauze or a bandage, if necessary. Decontaminate and remove protective lab clothing and proceed immediately to UEOHC or Emergency Room.

**Mucous membrane exposure.** Rinse tissue surface with copious amounts of water. Eyes will be irrigated for at least 5 minutes using the emergency eye wash station. Decontaminate and remove protective lab clothing and proceed immediately to UEOHC or Emergency Room.

**POST-EXPOSURE EVALUATION AND FOLLOW-UP**

After any exposure event, employees must:

**During daytime hours** (8:30 a.m. -4:30 p.m., M-F): Go to the University Employee Occupational Health Clinic, 966-9119, for treatment, consultation, assessment and documentation of exposure.

**After-hours:** Call Healthlink (966-7890) to report the bloodborne pathogen exposure and request that the MD on call for UEOHC after-hours bloodborne pathogen exposures be called. The on-call MD will determine the need for immediate prophylaxis and if needed, direct the worker to meet him/her in the ER or otherwise arrange for appropriate blood tests to be drawn and medications to be dispensed.

The post exposure medical evaluation will include documentation of routes of exposure and circumstances of incident, identification of source individual and testing (if possible), blood tests for HIV, HBV with consent from employee and post exposure prophylaxis and counseling.
The Principal Investigator and EHS must be notified of all exposures. An Employer's Report of Injury to Employee form (Form 19) must be completed by the employee at UEOHC. OSHA regulations require that this form be filed with the Environment Health & Safety Office within 48 hours of the incident. The Environment Health & Safety Office will investigate the circumstances of the exposure incident. A report will be made regarding the incident, and recommendations will be made to avoid further exposure incidents.

The University’s protocol for management of occupational exposures to HIV was developed by infectious disease specialists in the Department of Medicine and is identical to the protocol followed by the UNC Hospitals Employees Health Clinic. Current protocols for HIV post-exposure prophylaxis, necessitate immediate reporting of occupational exposures, so that administration of antiretroviral prophylaxis can be promptly initiated.

**Billing.** Charges for necessary services will be billed to the Environment Health & Safety Office and paid from the University's workers' compensation account. Workers' compensation will also pay for any necessary follow-up.

**Medical Records.** Medical records will be kept in confidentiality at the UNC Employees Occupational Health Clinic. Records are not disclosed or reported without the employee's express written consent to any person within or outside the workplace except as may be required by law. Employee medical records are kept for at least the duration of employment plus 30 years.

**Student Exposures.** Student Health Services (SHS) evaluates bloodborne pathogen exposures for UNC students including health affairs students. Students must go to the Student Health Clinic if the exposure occurs when SHS is open. The Acute Care Physician Extender or the on-call physician for SHS will evaluate the student. If the exposure occurs when SHS is closed, the student will call HealthLink at 966-7890. HealthLink will contact the SHS physician on-call who will then handle the initial evaluation and refer to the Infectious Disease Fellow if necessary.

**TRAINING**

The Standard requires that annual training be provided to all employees with the potential for occupational exposures. The required training is a condition for employment for all employees with the potential for occupational exposures. Bloodborne Pathogen training for laboratory employees is provided on-line at [http://ehs.unc.edu/ih/biological/bbp_lab.shtml](http://ehs.unc.edu/ih/biological/bbp_lab.shtml). This training provides an overview of the requirements of the Bloodborne Pathogens Standard, an explanation of the epidemiology and symptoms of bloodborne diseases; and an outline of the University's exposure control plan. The Environment Health & Safety Office will also conduct classroom sessions of this training at the request of any employee or department.

Documentation is kept at the Environment Health & Safety Office.

**INSPECTION**
All facilities covered by the Bloodborne Pathogen Standard will be inspected annually by the Environment Health & Safety Office. The inspection documents that all employees covered by the standard have received training and been offered the hepatitis B vaccine. The supervisor must document in the lab safety plan that engineering controls and work practices to prevent occupational exposures are in place.

**EXPOSURE CONTROL FOR UNC-CH EMPLOYEES LOCATED IN OTHER COUNTIES**

UNC-CH employees working in other counties are to make arrangements to receive training, HBV vaccinations, and post exposure evaluations and follow-up at other institutions or facilities located in their respective cities. They must send documentation for the required training and HBV vaccination records to their respective departments in Chapel Hill and to the Environment Health & Safety Office. They must also receive a copy of the UNC Exposure Control Plan. If they are working in another institution they are to follow the Exposure Control Plan for that institution.
APPENDIX A

Job classifications identified as potential occupational exposure

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<thead>
<tr>
<th>Access Control Shop Lead Technician</th>
<th>Clinical Dispensary Support</th>
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<tbody>
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<td>Access Installation Technician</td>
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Pharmacy Technician
Physician Assistant
Physician Extender
Physician Extender I
Physician Extender II
Plumber
Police Officer
Postage Meter Operator
Postdoctoral Research Associate
Postdoctoral Trainee
Pre-Doctoral Fellow
Preschool Assistant
Preschool Supervisor
Preventive Maintenance Inspector
Process Development Specialist
Processing Assistant
Professional Nurse
Professor
Program Assistant
Program Coordinator
Program Manager
Project Coordinator
Project Interviewer
Project Manager
Property Security Officer
Property Security Supervisor
Psycho Educational Therapist
Public Health Nursing
Public Safety Officer
Public Safety Telecommunicator
RCA Coordinator
Recruitment Coordinator
Regulatory Assistant
Research Specialist
Research Analyst
Research Analyst II
Research Assistant
Research Assistant Professor
Research Assistant Technician
Research Associate
Research Associate Professor
Research Coordinator
Research Fellow
Research Instructor
Research Intern
Research Lab Assistant
Research Lab Specialist
Research Nurse
Research Nurse Consultant
Research Nurse Coordinator
Research Operations Manager
Research Professor
Research Specialist
Research Study Coordinator
Research Study Nurse
Research Technician
Research Technician
Research Technician I
Research Technician II
Reserve
Reserve Officer
Resident
Resident & Student Clinic Nurse
Respiratory & Research Associate
Roofers
Safety Officer
Safety Prevention Officer
Security
Security Guard
Senior Hazardous Materials Specialist
Senior Laboratory Technician
Senior Research Specialist
Sergeant
Sheet Metal Mechanic
Social Research Assistant
Social Research Associate
Social Research Specialist
Social Work Practitioner
Social Worker
Spanish Interpreter
Student Worker
Study Coordinator
Substance Abuse Counselor
Support Services Associate
Support Services Captain
Supported Employment Supervisor
Surgical Assistant
Surgical Assistant Supervisor
Systems Analyst
Systems Specialist
Teaching Assistant
Team Leader
Tech Support Analyst Tech
Support Specialist Tissue
Culture Specialist University
Industrial Hygienist
Vascular Surgery Physicians Assistant
Vehicle/Equipment Operator
Veterinary Technician
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<tr>
<th>Position</th>
<th>Visual Arts Specialist</th>
<th>Vocational Supervisor</th>
<th>Workplace Safety Manager</th>
<th>X-Ray Technician</th>
<th>Zone Manager</th>
</tr>
</thead>
</table>

APPENDIX B

University Employee Occupational Health Clinic
CB # 1649, UNC-CH
919-966-9119

Hepatitis B Vaccine Declination

DIRECTIONS:
Please complete the following if you have previously received the Hepatitis B Vaccination series or if you are declining Hepatitis B Vaccination. After printing and completing the form, place in campus mail to the University Employee Occupational Health Clinic at CB 1649. It will be reviewed by a clinic nurse and you will be contacted if any further information is required. Feel free to call the clinic at 966-9119 if you have any questions.

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring Hepatitis B virus infection.

Please initial one of the following:

______________ I received the complete series of Hepatitis B Vaccine in _______ (year of vaccination).

I do not have original documentation.

______________ I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself; however, I decline Hepatitis B vaccination at this time. I understand that by declining this vaccine I continue to be at risk of acquiring Hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with Hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Employee signature

Date

Employee name

PID #

Job title / Department

CB #

Work phone or pager

To be completed by clinic nurse

Signature of UOEHC Nurse

Date reviewed