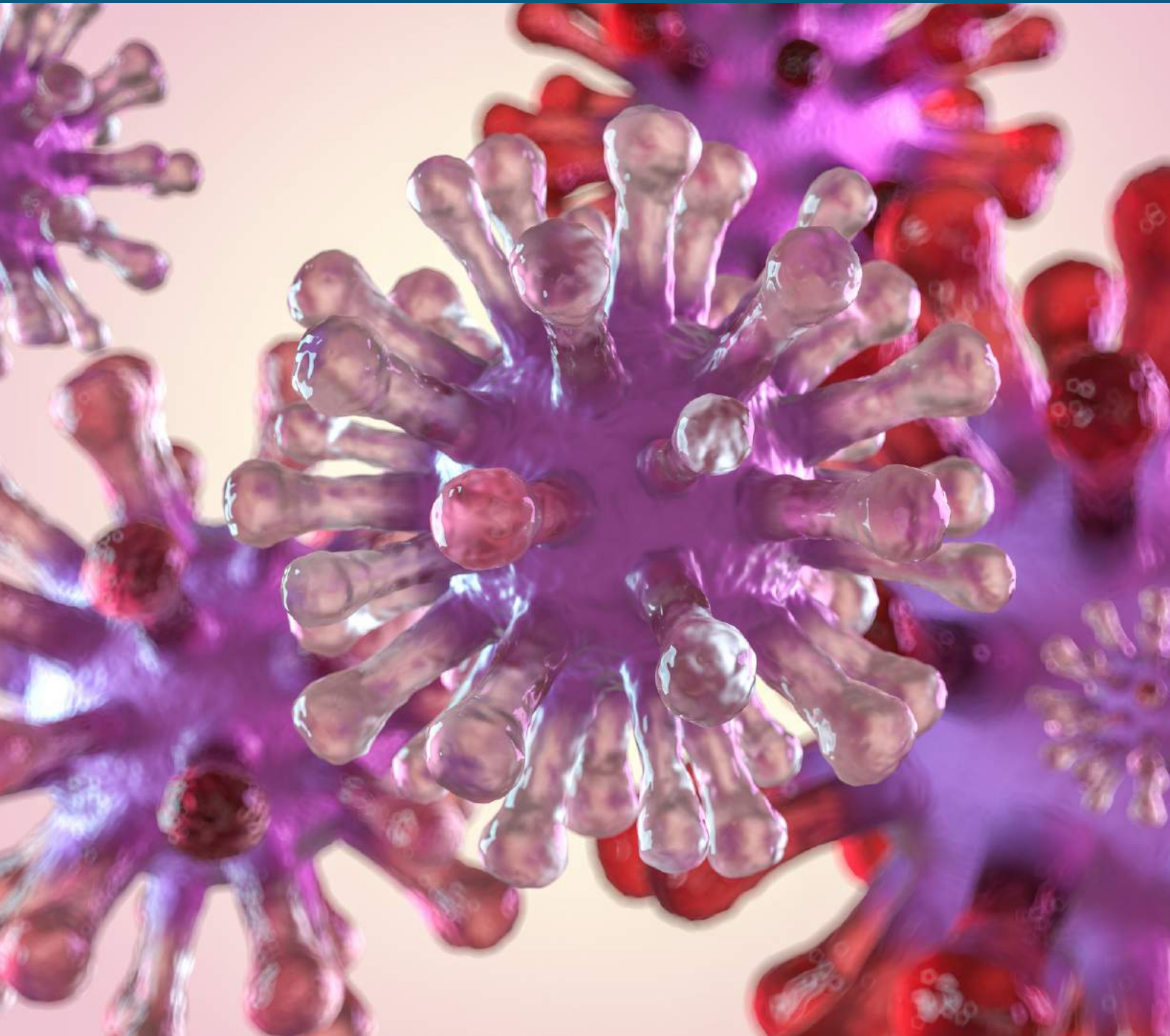




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Bloodborne Pathogens Certification Course

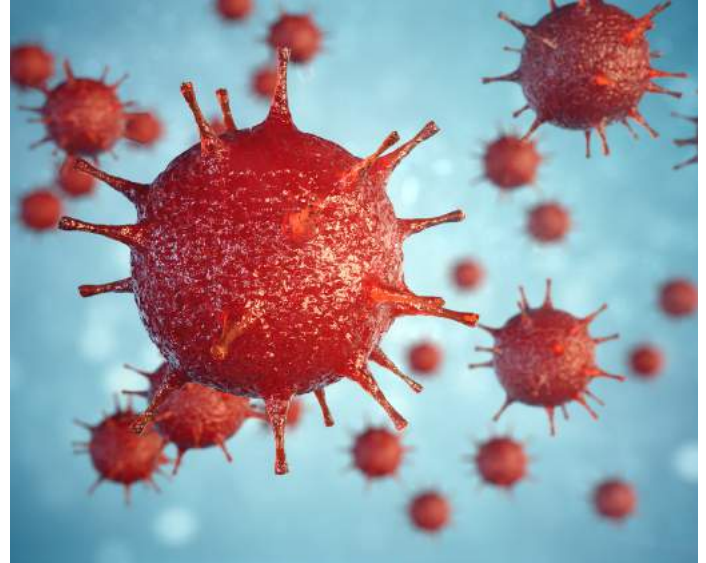




Introduction

Training is ideally determined by the education level, language, vocabulary and literacy of all prospective employees that are being trained. Additionally, all employees must be provided with annual training within a single calendar year of their last training session.

The employer has a duty to train every employee on the risks of Occupational Exposure in accordance with the specified requirements of the appropriate section. Training must be free of cost for each employee and provided solely during working hours. The employer must also provide additional training for changing work tasks, new procedures and responsibilities, as well as training based on new and emerging technologies. This training session must introduce new exposure risks by addressing any new changes within the field itself.





Definitions

Assistant Secretary – shorthand for the Assistant Secretary of Labor for Occupational Safety and Health, or their designated representative.

Blood – human blood including the components thereof and any products created with human blood.

Bloodborne Pathogens – any microorganism that, when exposed to human blood, can cause illness or disease. Some examples of bloodborne pathogens include human immunodeficiency virus (HIV) and hepatitis B virus (HBV) in addition to other similar diseases.

Clinical Laboratory – any work environment that is used to screen blood and other possibly infectious substances for diagnostic purposes.

Contaminated – a situation that occurs when there are infectious materials, such as blood, believed to be present on any surface or item.

Contaminated Laundry – linens or other laundry items that might contain sharps or that have been exposed to or contain human blood or another possible substance that could be infectious.

Contaminated Sharps – an item that contains an infectious substance and can also break the skin. Some examples include any broken glass tubes, vials, glasses, needles, dental wires, or scalpels.

Decontamination – the action of removing any infectious substance. Both physical and chemical means can be employed to remove blood or other pathogens from surfaces and items to ensure that they cannot be transmitted. It is also used to ensure that items are safe to dispose of, use, or handle.

Director – shorthand for the person who holds the position of the Director of the National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or their designated representative.

Engineering Controls – protocol steps that are put into place to decrease the likelihood of contamination. Some examples include needless systems, sharps with built-in protection, altered medical devices, sheathed needles, and containers for safe disposal of sharps. The purpose of these measures is to decrease or eliminate the chance of bloodborne pathogens becoming a workplace hazard.

Exposure Incident – an incident that occurs as an employee is performing their regular duty. The employee comes into contact with a possible infectious substance or blood in their eye, mucous membranes, mouth, or non-intact skin.

Handwashing Facilities – the area where employees have direct access to clean, potable water, a disinfectant or cleanser, and air-drying machines or personal paper towels.

Licensed Healthcare Professional – the title of a person who has fulfilled the legal requirements that allow them to perform the actions associated with paragraph (f) of the Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up protocols

HBV – an abbreviation for hepatitis B that is caused by the HB virus. This virus causes an infection in the liver that can become quite serious in some people. While there is a preventative vaccine for the virus, there is no cure at this time.

HIV – an abbreviation for the human immunodeficiency virus. HIV is a virus that can lead to the onset of AIDS. Because of the damage that it causes to the immune system, it can lead to death. There is no current cure for HIV although a lot of progress is being made with anti-retrovirus drugs.





Definitions

Needleless systems – a system that does not require the use of needles when performing the following tasks:

1. Collection or withdrawal of bodily fluids once initial venous or arterial access is made;
2. Administration of fluids and medication; or
3. Other procedures that involve the chance of exposure to bloodborne pathogens.

Occupational Exposure – the exposure to blood pathogens or other possibly infectious substances that can be expected to happen as one performs their employment duties.

Other Potentially Infectious Materials (OPIM):

1. Body fluids including but not limited to: amniotic fluid, pleural fluid, semen, saliva in dental procedures, body fluid contaminated with blood, peritoneal fluid, pericardial fluid, vaginal secretions, synovial fluid, cerebrospinal fluid, fluids in situations when it is difficult or impossible to determine different body fluids;
2. Unfixed tissue or organ that is taken from a human (alive or deceased); and
3. Cells or tissues that contain HIV, organ cultures, and solutions or other mediums that contain HBV or HIV; and tissues, organs, blood, and fluids taken from animals that have been infected with HBV or HIV for experimental purposes.

Parenteral – the action of using needles, biting, abrasions or cuts to pierce mucous membranes.

Personal Protective Equipment (PPE) – specialized clothing utilized by an employee for hazard protection. Any “regular” clothes that are worn to work would not fall under this definition if they do not have the ability to protect the wearer from harm and biomedical hazards.

Production Facility – a facility that produces HIV or HBV on an industrial scale.

Regulated Waste – any waste product that contains items that have possible contamination or contain blood or other infectious materials.

Research Laboratory – a laboratory that uses or produces a high volume of HBV or HIV. The volume at a research laboratory is less than that produced at a production facility.

Sharps with engineered sharps injury protections – a device that is used to withdraw blood or fluids that has been engineered with built-in safety systems to protect an employee utilizes the device to access a vein or artery.

Source Individual – the living or dead person who is a carrier of infection to employees that interact with their body, remains, or organs removed from the body.

Sterilize – a common practice that is used to remove microbes and resistant endospores from items and devices in order to reduce the risk of harm.

Universal Precautions – a widely used protocol that is put in place to minimize infection from bloodborne pathogens including HBV and HIV.

Work Practice Controls – any effort that is implemented to reduce an employee’s exposure to potential harm by changing the way that common work practices are performed carried out when working with bloodborne pathogens.





Pathogens

What is a bloodborne pathogen?

Bloodborne pathogens are infectious microorganisms in human blood that can cause illness and disease in human beings.

Three main pathogens specifically addressed by the BBP guideline are:

- Hepatitis B (HBV)
- Hepatitis C (HCV)
- Human immunodeficiency virus (HIV)

Other pathogens can include:

- Herpes
- Ringworm
- Impetigo
- Staphylococcus Aureus
- Scabies
- Molluscum Contagiosum
- Tuberculosis

What are the modes of transmission?

Bloodborne pathogens are transmitted through contact with infected human blood and Other Potentially Infectious Body Materials (OPIM).

OPIM include:

- Amniotic fluid
- Semen
- Cerebrospinal fluid
- Contaminated blood
- Pleural fluid
- Synovial fluid
- Peritoneal fluid
- Vaginal secretions

Modes of transmission can occur when an infected person's fluids contact a mucous membrane or broken skin in the genitals, rectum or mouth as well as through the nose, eyes and mouth. Infectious blood can also be carried through acne, cuts, abrasions, or any other kind of open sore when there is contact with infectious blood/fluids.

Some examples of transmission modes are:

- Needles
- Personal hygiene items
- Syringes
- Body piercings
- Tattoos
- Sexual contact
- Mother to child (before/after birth)
- Skin punctures from contaminated sharps/needle





Precautions

What are the Universal Precautions?

Universal Precautions are the Occupational Safety and Health Administration's (OSHA) approach to controlling and containing the potential for bloodborne pathogens transmission in blood and other bodily fluids. Universal Precautions ensure safety to all who come into contact with infected persons and help prevent exposure when encountering OPIM or blood.

To stop direct contact with potentially infectious blood and substances, Universal Precautions must be observed at all times. It's important that every bodily fluid is considered potentially infectious and high-risk when it comes to bloodborne pathogen scenarios.

To protect yourself from infectious fluids or blood you must follow Exposure Control Plans through:

- Engineering Controls
- Best Work Practices
- Personal Protective Equipment





Controls

What are Engineering Controls?

Engineering Controls isolate the employee from exposure to BBP and hazardous materials by physically changing an environment or instrument. Engineering controls must be replaced regularly to ensure effectiveness, and always be maintained and examined properly.

A few examples can include:

- Bench top splashguards
- Needle safety devices
- Biological safety cabinets
- Blood and capillary tubes
- Personal protective equipment
- Sharps/waste disposal containers
- Biohazard symbols, brooms/mops, safety cones and other pertinent safety equipment

Containment equipment

Containment equipment can include but is not limited to:

- Biological safety cabinets
- Animal cages
- Laboratory decontamination
- Plant survival systems
- Centrifuge containers

What are a few examples?

Biological safety cabinets (BSC) are enclosed, ventilated laboratory workspaces dedicated to safely working with materials contaminated with BSAT (Biological Select Agents and Toxins).

Alkaline hydrolysis digesters, pathological incinerators, or other approved means, should be provided for the safe disposal of the large carcasses of infected animals. Redundancy and the use of multiple technologies need to be evaluated and considered.

An Effluent Decontamination System (EDS) is a system that sterilizes biohazardous liquid waste generated from biocontainment laboratories or other facilities prior to discharge. Building ventilation and exhaust or HVAC must provide safe, breathable and comfortable environments for all employees and the public, and to minimize exposure to hazardous air contaminants. At BSL-3 and BSL-4, exhaust laboratory air must be directly exhausted to the outside since it is considered potentially contaminated.

High-Efficiency Particulate Air (HEPA)-filters can be used to exhaust room air in order to stop hazards from being released to the outside environment. The HVAC exhaust system must be sized to handle both the room exhaust and the exhaust requirements of all containment devices that may be present. Adequate supply air must be provided to ensure proper functionality of the exhaust system.





Controls

Additional containment of BBP

Additional containment involves the protection of the environment external to the workshop and clinical laboratory from exposure to potentially infectious materials. It is provided by a combination of efficient facility design and proper operational practices.

Secondary containment may include:

- Separation of the laboratory work area from areas of public access.
- Availability of decontamination equipment, such as separate dirty and clean corridors, autoclave, washing facilities, double entryways, etc.

How to enclose and isolate BBP

Common isolation techniques are utilized to create a contaminant-free area either around the equipment or around employee workstations. Isolation places the hazardous process far away from most of the workers, while an enclosure keeps a selected hazard physically separated from workers.

Enclosed equipment, for example, is tightly sealed and it is typically only opened for moving samples and cultures or for cleaning and maintenance. Care must be taken when the enclosure is opened for maintenance as exposure could occur if proper precautions are not taken. The enclosure itself must be well maintained to prevent leaks.

What are Work Practice Controls?

Work Practice Controls are how tasks can be performed to reduce risk and exposure to BBP or OPIM.

Prohibited practices include:

- Cosmetic application
- Handling of contact lenses
- Drinking, eating, or smoking
- Food and beverages near or in contact with OPIM or blood
- Recapping, breaking or bending needles
- Mouth pipetting

Other Work Practice Controls include restricting workshop or clinical laboratory access to employees with permission. Workshop or clinical laboratory personnel should frequently cleanse their hands with soap and water in respective hand washing facilities and use a no-hands procedure when disposing of contaminated objects.





Equipment

What is Personal Protective Equipment?

PPE (Personal Protective Equipment) keeps you safe from blood, hazardous materials, and OPIM.

PPE includes:

- Face shields
- CPR shields
- Gloves
- Goggles
- Gowns
- Masks

If and when required, employees must wear these protective garments whenever they anticipate any likelihood of exposure. Additionally, employees should wear surgical caps or hoods and shoe covers/boots in instances when gross contamination can reasonably be anticipated.

All Personal Protective Equipment promotes safety by creating a barrier between you and the infection/hazardous materials. Before arriving at the scene of the accident, you must assess the situation to determine the risks and to use the proper PPE.

PPE must be selected appropriately for each unique task and must be readily accessible for all employees. In extraordinary and rare cases an employee may temporarily and briefly forego the use of PPE. If this occurs, the employer must document and investigate such a situation thoroughly to determine how to prevent it further down the line. If an employee is allergic to any PPE item, the employer is required to provide an alternative. Employers must also be sure that all employees are familiar with the types of equipment they'll use before engaging or handling hazardous materials, OPIM or blood.

PPE examples include CPR shields provide protection against exposure when performing CPR. Face shields provide splash and high impact protection, while gloves protect against exposure from skin contact with chemicals, infectious agents, cold, heat, and cutting objects. For proper protection, be sure to use the correct hand.

Goggles are designed to reduce the risk of exposure to laser radiation, chemical splashes, or flying debris. Gowns are used to prevent the penetration of infectious blood, hazardous materials, or other OPIM. Masks are used to protect the employee from airborne materials or liquid contaminating the face.

How to clean and decontaminate PPE

Employees responsible for cleaning surfaces that could be contaminated with bloodborne pathogens must be protected from exposure. Employers are tasked with ensuring that workers are protected from said exposure and that they are not exposed to harmful levels of chemicals used for disinfection or cleaning.

What are the guidelines?

Any visible surface contaminated with blood, urine, faeces, vomit, or other body fluids must be immediately cleaned and disinfected. Isolate any areas of suspected contamination until the decontamination process is complete to reduce the risk of exposure to individuals who are not carrying out the work. All bulk spill matter or visible contamination must be treated with an appropriate disinfectant before any clean up or the removal of bulk material begins. After disinfecting and disposing of the bulk material, use a disinfectant to decontaminate and clean the area.





Equipment

Any spills should be covered with an absorbent material. Then, a disinfectant should be applied to saturate the area and soak into the spills. This will allow the bleach to kill any infectious agent or virus that could be present. When using disinfectant, ensure adequate ventilation by opening windows and doors or using appropriate ventilation equipment. If chemical disinfectants are used, an employer may have to train workers on how to protect themselves against chemical hazards.

How to use disinfectants

To disinfect surfaces after bulk spill material has been removed or to treat contamination, use an EPA-registered disinfectant suitable for non-enveloped viruses. If commercial disinfectant products are not available, household bleach or other disinfectants are suitable alternatives. Use a 1:10 solution of bleach to water and mix the chemicals together before use. Note: certain combinations can be deadly or reduce the disinfectant's effectiveness.

When to use respiratory protection

If workers are exposed to bio-aerosols suspected of or known to contain OPIM, blood and other hazardous materials, respiratory protection is necessary. In these situations, medically qualified employees must use a fit-tested N95 respirator (NIOSH-approved) at a minimum.

How to clean equipment

An employer must choose Personal Protective Equipment (PPE) that will safeguard workers against bloodborne pathogens to which they could be exposed to when cleaning. PPE used for cleaning includes gowns, goggles, gloves, face shields, and face masks. As well as protective leg, sleeve, and fluid-impermeable or fluid-resistant shoe coverings will lower the risk of contact with infectious materials. Respiratory protection may also be required to shield workers from exposure to OPIM, blood, and other hazardous materials.

How to remove PPE

Employees should remove protective clothing before leaving the room, and dispose of it in an appropriately designated area or container for washing, storage, disposal or decontamination. Once the disinfection and cleaning processes are complete, remove all PPE and wash your hands with soap and water. Use an alcohol-based hand gel if there's no access to clean, running water.

How to properly dispose of waste

Any PPE or materials used during cleanup and decontamination need to be soaked in disinfectant. Once soaked, double-bag them and place the gear in a leak-proof container to minimize further risk of exposure. If there are sharps, use a puncture-proof container. If you have to dispose of contaminated objects which have porous surfaces that can't be disinfected, follow all regulations and guidelines for correct disposal.





Equipment

Wash hands correctly

This part of the plan should describe your guidelines for hand-washing. These procedures should include a provision for workers to wash their hands as soon as possible after blood comes into contact with their eyes, skin, or mucous membranes. This must be carried out after PPE or gloves have been removed.

If running water is not available, your hand-washing plan must outline what alternatives your workers must use to clean their hands, such as disinfectant towels or hand sanitizers. In emergency situations at remote sites, employees must wash their hands under running water as soon as they are able.

How to flush eyes or mouth

If your eyes are splattered with blood or OPIM, immediately flush with water or saline eyewash for 5-10 minutes; if splashed in your mouth or on your face, rinse with water for 5-10 minutes.

How to decontaminate equipment

To ensure those involved in the handling, transportation and repair of equipment are not exposed to infectious materials, all equipment must be decontaminated before being repaired or shipped. Here, your procedures should outline the steps to follow to clean equipment before it is handled by someone else. This might include instructions for disassembly to allow internal components to be decontaminated.

If full decontamination cannot be carried out, you will need to attach a label displaying a biohazard warning. You will also be required to indicate which portions of the equipment are still contaminated. You are free to choose the labeling method you use, but self-adhesive labels, string tags, and sheets of paper are all acceptable.

How to handle specimens

If your employees will handle specimens, you will need to identify and outline the best work practices for proper handling. This could include describing the appropriate methods for packaging specimen containers for shipping. If you don't handle specimens, you don't need to complete this section.

How to handle sharps

Needles should never be recapped or bent by hand unless absolutely necessary, and your procedures should require that all sharps are placed in puncture-resistant containers which are easily identifiable. Also, these containers must be located as close as possible to where sharps are likely to be found or used, such as hospital laundries.

Your decisions regarding the disposal of sharps must be supported by sound professional judgment. For example, you may decide to place containers in each examining room where a needle is used. Sharps with engineered injury protection must also be placed in the appropriate container once they've been used.





Labeling

What are the color coding & biohazard label requirements?

The Bloodborne Pathogens Standard is used to disclose potential hazards, so ensure you use the proper labels and signs to communicate hazards to workers (see example images).

The right warning labels must be attached to these containers:

- Containers for contaminated reusable sharps
- Regulated waste
- Freezers and fridges housing OPIM or blood
- Any other containers used to store, ship or transport OPIM or blood
- Containers or bags carrying contaminated laundry
- Contaminated equipment being serviced or shipped

In facilities, red bags or containers can be used instead of labels. However, signs must be posted on all doors in HIV/ HBV research laboratories or production facilities where infected animals or OPIM in containment modules are present. Before working with HIV or HBV, employees should have prior knowledge and experience in handling tissue cultures or human pathogens.

The biohazard symbol will have to be in a contrasting color to a fluorescent orange and/or red background.





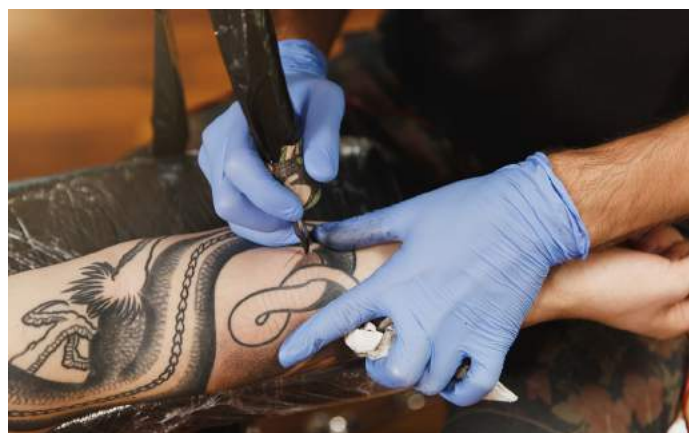
Plans

What is an Exposure Control Plan?

An Exposure Control Plan will answer questions regarding BBP and ensure the appropriate exposure control activities are in place. If exposure to OPIM, blood and other hazardous materials is possible, an employer is required to develop an Exposure Control Plan by the OSHA Bloodborne Pathogens Standard. A copy of the Exposure Control Plan must be made accessible to all employees.

According to the OSHA Bloodborne Pathogens Standard, an Exposure Control Plan must meet the following criteria:

- It must be specific for each facility
- It has to be reviewed and updated every year to reflect possible changes, such as new technology to reduce exposure to hazardous materials, blood or OPIM.
- Workers must be kept up-to-date on the uses of the Exposure Control Plan
- All employees must know where it's kept so it's accessible to them should they need it



Hepatitis B vaccine

Once employees complete the required BBP training, employers must offer them a hepatitis B vaccination. The vaccination must be offered within 10 days of an employee being assigned to a job with Occupational Exposure. If employees do not want the vaccination, make sure they sign a statement confirming this. If boosters are needed, these should be readily available to employees at no extra cost.

The hepatitis B vaccine is highly effective and protects against the hepatitis B virus. For those who may be HBV carriers or are already immune to the virus, the vaccine causes no harm. It will protect workers against hepatitis B infection as well as its complications. One of the main complications is permanent liver damage, which can lead to liver cancer or even death. It's important to stress to employees that having the immunization protects those around them too.





Waste

How to dispose of biohazardous waste

All employees at risk of Occupational Exposure to biohazardous waste will need to receive training, both initially and yearly going forward.

Communication of biohazardous materials to employees

A biohazard warning label must be added to every container or bag of medical waste and all waste must be disposed of properly.

Regulated waste is any of the following:

- Contaminated items that could potentially release OPIM or blood in a semi-liquid or liquid state if they are compressed
- Contaminated sharps
- Liquid or semi-liquid blood or OPIM
- Items which are covered in OPIM or dried blood and could release these materials during handling
- Microbiological and pathological waste containing OPIM or blood

To verify that bags containing non-regulated waste have been decontaminated and pose no health risk, all containers must be labeled, dated and signed. Note, these bags shouldn't be orange, red or have a biohazard symbol. Housekeepers and custodians won't handle regulated waste and will not dispose of bags containing human or animal blood, vials of blood, biohazardous waste, and bloody rags or towels from labs

unless the bag is clearly labeled as non-hazardous. These custodians will have been instructed not to handle any non-regulated waste unless it's marked and labeled.

If it has been decontaminated or autoclaved before disposal, non-regulated waste can be disposed of in plastic trash bags in a regular dumpster. If they are to be disposed of in the regular trash after autoclaving, unlabeled autoclave bags should be used. Note: biohazard bags cannot be disposed of in a regular trash dumpster, so once waste is placed in a biohazard waste bag, it must be disposed of following the correct procedures.

Any regulated waste must be disposed of in red biohazard bags or properly labeled containers. Sharps must also be placed in a puncture-resistant container. These containers and bags should be taken to your designated collection facility. You will need to refer to your bloodborne pathogens Exposure Control Plan for the right disposal procedures to follow.





Procedures

What are the emergency procedures?

In an emergency situation involving potentially infectious materials or blood, you should try to minimize your exposure by following all procedures.

What to do if exposed

You should report the exposure to your supervisor as soon as possible and fill out an exposure report form. The form will be kept in your personal file for 40 years, allowing you to keep track of any workplace exposure to hazardous materials. If you have not already received a hepatitis B vaccination, you should go to HR to request one. They can also carry out blood testing.

What are the post-exposure procedures?

Unless prohibited by law or physically impossible, identify and document the source individual. You'll need to note down the route of exposure as well as the circumstances surrounding the exposure Incident. The individual's blood should be tested for HIV and HBV as soon as possible.

If the source individual is known to have a positive HIV or HBV result, testing does not need to be done. You will need to administer post-exposure prophylaxes as recommended by the US Public Health Service, offer counseling and evaluate any reported illnesses.

If you consent to baseline blood testing, but do not give your consent for HIV screening, ask how long your blood sample will be stored. If you decide to consent to having your blood sample tested in future, the testing should be carried out as soon as possible. Note: any other diagnoses will remain confidential.

Obtain healthcare professional's written opinion

Once an evaluation is complete, the employer should obtain and provide the employee with a copy of the healthcare professional's opinion within 15 days. The licensed healthcare professional's opinion on the hepatitis B vaccination will be limited to whether the employee has received the vaccination and if it's indicated for them.

In terms of post-exposure follow-up and evaluation, the healthcare professional's written opinion will be limited to the following information:

- The employee has been told about the results of the evaluation
- The employee has been informed of any medical conditions caused by exposure to infectious materials or blood which require treatment or further evaluation.

Note: any other findings will remain confidential and will not be included in the written report.





Procedures

What are the Recordkeeping Requirements?

Methods of compliance include:

- Engineering and work practice controls (such as: safer medical devices, sharps disposal containers, hand hygiene);
- Universal Precautions;
- Personal protective equipment;
- Housekeeping (such as: decontamination procedures and removal of regulated waste);
- Personal protective equipment.

Documentation of:

- The annual consideration and implementation of appropriate commercially available and effective safer medical devices designed to eliminate or minimize occupational exposure, and
- The solicitation of non-managerial healthcare workers (who are responsible for direct patient care and are potentially exposed to injuries from contaminated sharps) in the identification, evaluation, and selection of effective engineering and work practice controls.

The Exposure Control Plan must be reviewed and updated at least annually, and whenever necessary to reflect new or modified tasks and procedures which affect occupational exposure and to reflect new or revised employee positions with occupational exposure.

Employers are subjected to provide access for employees to medical records and relevant records to their designated representatives, and subject access to these records to representatives of the Assistant Secretary so, in line with the Occupational Safety and Health Act, they are able to fulfill their duties.

What is the Hazard Communication Standard?

Employers must provide employees with training and information on hazardous chemicals in their workspace as well as the requirements of this standard.

Other information can include:

- The use of material safety data sheets and labels
- The details and location of the written hazard communication program
- Protection methods and health hazards of chemicals in the workplace, including PPE
- Adequate training in PPE and when it's required
- How to choose, maintain, use and dispose of PPE

Note: Employers are expected by OSHA to document that they have met the training requirements for each employee. Standards specify all documentation should contain the name of the employee as well as the subject and date of training.





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