Student Workbook

Bloodborne Pathogens

BBP & AIRBORNE PATHOGENS TRAINING FOR HEALTHCARE AND WORKPLACE ENVIRONMENTS

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Bloodborne Pathogens Training Program

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In 1991, OSHA issued the Occupational Exposure to Bloodborne Pathogens Standard (29CFR 1910.1030), and later expanded it to include needle safety protocols. The purpose of the Standard is to reduce the risk of occupational exposure to bloodborne pathogens.

This training will satisfy the OSHA annual training requirement in bloodborne pathogens awareness.

You will learn:

- What bloodborne pathogens are & why they are dangerous.
- Basic information regarding HIV, hepatitis B (HBV) and hepatitis C (HCV).
- The routes of exposure, techniques to reduce the risk of exposure, and the use of personal protective equipment (PPE).
- The resources available to employees in the workplace.
- How to respond safely to an emergency at work.
- Guidelines for postexposure situations.

The Bloodborne Pathogens Standard

Why do I need this training?

- To provide care to an injured or ill person.
- To handle contaminated sharp objects.
- To safely clean a blood or body fluid spill.
- To learn what to do if exposed to BBP.

If you need to perform a duty that exposes you to bloodborne pathogens, knowing the risks, routes of entry, and protective and preventive measures can make the difference between another day at work and contracting a life-long, debilitating or fatal disease.

Who is covered by the Occupational Exposure to Bloodborne Pathogens Standard?

All employees who could come into contact with blood or other potentially infectious materials (OPIM) while performing their jobs, even if wearing personal protective equipment. At-risk employees can include a coworker coming to the aid of a bleeding victim; public safety, correctional and first responders; healthcare and dental workers; custodial or maintenance personnel; workers in labs, tissue or blood banks, laundries or mortuaries; workers handling medical equipment or regulated waste; workers who provide body art.

What are bloodborne pathogens (BBP)?

Disease-causing microorganisms that are present in human blood. They may be transmitted through exposure to the blood or certain body fluids of an infected person. Although many bloodborne pathogens can transmit disease, the ones of greatest concern in the workplace are HIV, hepatitis B, and hepatitis C.

What are Other Potentially Infectious Materials (OPIM) besides blood?

OSHA's definition of OPIM includes: 1) human body fluids, 2) unfixed (fresh) tissue or organs from a human, and 3) any cell, culture, fluid, tissue, or organ containing the HIV or hepatitis B virus.

What is an Exposure Incident?

OSHA defines an exposure incident as "a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral [under the skin] contact with blood or OPIM that results from the performance of an employee's duties."

Human Immunodeficiency Virus (HIV)

HIV is a virus that breaks down the immune system by killing T-Cells, which help the body fight infection. AIDS (acquired immunodeficiency syndrome) is the most advanced stage of HIV infection. A person may be diagnosed with AIDS when his or her T-cell count falls below a certain level, or when an AIDS-defining disease is present. AIDS allows illnesses that our body can normally fight to run rampant and create more serious problems (e.g. the common cold turns into a fatal case of pneumonia).

There are over 1 million cases of HIV in the U.S., with 56,000 new cases each year. There is currently no vaccine or cure for HIV. Anti-HIV medications can slow the development of AIDS.

How is HIV transmitted?

HIV is transmitted through blood, semen, vaginal secretions, breast milk, and other body fluids containing blood, such as saliva from dental procedures. Healthcare workers and first responders may come into contact with additional body fluids that may transmit disease, including amniotic, cerebrospinal, synovial, pleural, peritoneal, and pericardial fluids. The primary methods of transmission are through unprotected sex with an infected person, and sharing needles during injection drug use.

Although HIV has been found in low quantities in the saliva and tears of infected individuals, contact with these fluids has never been shown to result in transmission of HIV. There is no known transmission from sharing food or drink, towels, tools, or restroom facilities.

Signs and Symptoms of HIV/AIDS

A person newly infected with HIV usually experiences flu-like symptoms, then may have no symptoms for years. When symptoms appear, they may include any of the following:

- Anorexia, weight loss
- Fatigue, weakness
- Persistent cough
- Swollen lymph nodes
- Diarrhea, abdominal discomfort
- Mouth lesions, dark skin blemishes
- Afternoon fevers, night sweats, chills
- Memory loss, neurological disorders
- Increased illnesses due to a weakened immune system

More than
1M
HIV+ in US

Hepatitis B and C

Hepatitis, or inflammation of the liver, is usually caused by a viral infection. The biggest concern in the workplace are the hepatitis B and C viruses, which can cause serious illnesses.

Hepatitis B Virus (HBV)

HBV can cause lifelong infection, cirrhosis (scarring) of the liver, liver cancer, liver failure, and death. There were 38,000 new cases in the U.S. in 2008. Adults infected with HBV usually recover, but 5 - 10% develop chronic infections.

1.4M
with chronic HBV

Hepatitis C Virus (HCV)

Hepatitis C can cause acute or chronic infection, chronic liver disease, and death. There were 18,000 new cases in 2008 in the U.S.

3.3M
with chronic HCV

How are HBV and HCV transmitted?

Hepatitis B and C can be contracted through direct contact with the blood or body fluids of an infected person. HBV and HCV are usually spread through needlesticks or sharps exposures on the job, sharing needles during injection drug use, from an infected mother to her baby during birth, or during unprotected sex with an infected person (rarely HCV).

Many infected persons have no signs or symptoms of illness, but can still transmit the disease to others. HBV and HCV cannot be spread by casual contact (working, studying, or playing), food or drink, sharing restroom facilities, or from insects.

Signs and Symptoms of Hepatitis B and C

- Jaundice
- Fatigue
- Loss of appetite
- Nausea and vomiting
- Abdominal pain
- Diarrhea
- Dark urine
- Joint pain (HBV)

Hepititis B is more easily transmitted than HIV or HCV.

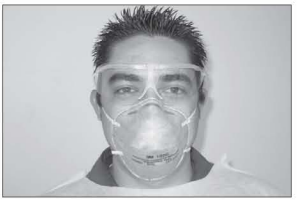
Workplace Transmission

Transmission of a bloodborne pathogen to a non-infected person is not common at work, but can occur. For a bloodborne pathogen to be transmitted to a non-infected person, there must be a route of entry.

Routes of entry:

Mucous membranes:

- Unprotected eyes, mouth, and nose
- Unprotected sex



Protect routes of entry

Skin breakdown:

- Cut, open wound, or fresh scab
- Rash
- Hangnail

Puncture:

- Needlestick
- Handling contaminated sharp objects
- Sharing used needles (I.V. drug abuse)

Protection from HIV, HBV and HCV

Use precautions in all situations that risk exposure to blood, body fluids and secretions.

- Avoid unprotected sex with an infected person or multiple partners.
- Do not share items which could be contaminated with blood (e.g. needles from injection drug use, razors, toothbrushes).

Protection in the Workplace

- Get vaccinated against hepatitis B. The vaccine has been shown to be safe and effective.
- Use universal precautions when there is a risk of exposure to blood or body fluids.
- Use personal protective equipment to protect routes of entry.
- Follow your organization's Exposure Control Plan.

Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) are coverings that protect potential routes of entry from exposure to bloodborne pathogens. The employer must provide PPE to at-risk employees.

Standard PPE includes:

- Gloves (disposable and watertight)
- Protective clothing (gowns, aprons, lab coats, shoe covers)
- Face shields, face masks, eye protection
- Ventilation devices or CPR barrier masks

Specialized tasks may involve additional PPE.

Personal Protective Equipment

PPE requires training for proper use

- It should fit correctly, and be used appropriately for each situation.
- Store PPE in each workstation, first aid kit, and any other sites of potential exposure to BBP. Discuss the location of gloves with your employer.
- Remove PPE as soon as possible after an exposure and before leaving the scene.
- Dispose of contaminated PPE as regulated waste in a red plastic bag or proper leak-proof container marked with the biohazard label. Follow state guidelines where indicated.
- Uncontaminated PPE may be discarded in the regular trash.
- Wash your hands thoroughly after removing PPE.

Gloves are the most common form of PPE.

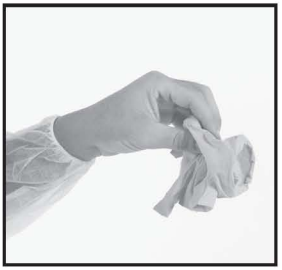
- Gloves are waterproof, and usually designed for one time use. Use non-latex gloves if possible.
- Use gloves for patient care or clean-up of BBP. Check for holes before use: blow the glove like a balloon; if it holds air, it is watertight.
- Bandage cuts before putting on gloves, because gloves may tear. Double glove for additional protection.
- Remove soiled gloves with care to avoid splashing or creating droplets of blood in the air.

Removing Soiled Gloves

Proper removal of contaminated gloves helps to reduce exposure potential. Remove gloves slowly to avoid spattering and cross-contamination.

Pinch the base of one glove and slowly peel it off. Hold it in the other hand.

Slip one or two fingers inside the other glove and carefully peel it off, creating a bag for both gloves.



Dispose of them properly, according to your workplace policy.

Exposure Control Plan

The Exposure Control Plan is a written plan that identifies who is at risk for what type of BBP exposure, how to determine if an exposure has occurred, and how to manage an exposure. It should be easily accessible to all employees, and reviewed annually. Most Exposure Control Plans include both engineering and work-practice controls.

Engineering controls are items or hardware that isolate or remove BBP hazards from the workplace. They include sharps disposal containers, needleless systems, self-sheathing needles, and specially marked bags for contaminated waste.

Work-practice controls are systems or everyday practices in the workplace that reduce the risk and exposure to BBP (e.g. a company policy that says to use watertight gloves when responding to emergencies).

An Exposure Control Plan should address the following:

- Sharps management
- Spill clean-up
- Regulated waste
- Contaminated laundry
- Labeling
- Hand washing
- Hygiene
- Maintenance and housekeeping
- HBV vaccination
- Postexposure follow-up

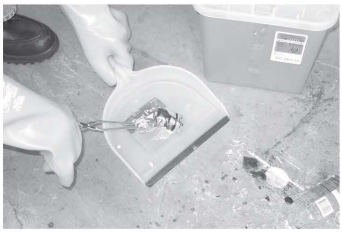
Management of Sharps

Needlesticks are the most common cause of occupational exposure to bloodborne pathogens. There are about 800,000 needlesticks annually in the United States.

A **contaminated sharp** is any object contaminated with blood or OPIM that can penetrate the skin. These can include needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

The employer is required to record all sharps injuries. A confidential **sharps injury log** must be part of the Exposure Control Plan and must include:

- Type and brand of device used in the incident
- Location of the incident
- Description of the incident



Techniques for handling sharps:

- Use tools (tongs, broom, dustpan) to pick up broken glass and other sharps.
- Wear PPE.
- Dispose of all sharps in a closeable, puncture-resistant container with a biohazard label.
- Keep sharps containers within easy reach and plainly visible.
- Change a sharps container when it is 2/3 full.
- Use a needleless system or other advanced technology in labs and healthcare settings.
- Review sharps management policies and new technology and products at least annually.
- Follow your state's needle safety legislation.

DO NOT

- Recap needles
- Break/bend needles

Blood Spills

Clean-up of blood spills should occur as soon as possible. Follow your workplace Exposure Control Plan. The goal of clean-up is to disinfect the area of potentially infectious materials.

There are several EPA-registered commercial germicides available. If you do not have one available, use a chlorinated bleach solution.

Mix 1 part chlorinated bleach to 10 - 100 parts water (1:10 to 1:100).

- Solution concentrations vary depending on the size and type of spill.
- Change the bleach/water solution daily.

Guidelines for cleaning a blood or OPIM spill:

- Clear the immediate area to reduce further contamination/exposure.
- Locate the BBP spill kit and PPE.
- Put on appropriate PPE (mask, goggles, gloves, gown and shoe covers).
- Clean the area of visible blood and OPIM with paper towels or an absorbent powder.
- Disinfect the area for at least 10 minutes. If a germicide is available, follow the manufacturer's guidelines for use. If a commercial germicide is unavailable, use a chlorinated bleach and water solution.
- Dispose of soiled clean-up materials in a properly- labeled container according to workplace policy. Follow state guidelines where indicated.
- Wash your hands.

Labeling

Regulated waste is soiled material from clean-up, or any discarded item contaminated with blood or OPIM. It requires special clean-up, handling and disposal by an appropriate medical waste company. Examples include bloody gauze, heavily soiled gloves, and contaminated shoe covers. Containers for regulated waste (other than contaminated sharps) should be closeable, leak-proof, and labeled or color-coded to indicate a biohazard. Follow state guidelines where indicated.

Contaminated laundry should be handled as little as possible. Place it in a properly labeled, closeable, leak-proof container. Use a professional laundry service that will pick it up and clean it.

Warning labels must be attached to:

- Containers of regulated waste, contaminated laundry, or any items exposed to blood or OPIM
- Refrigerators and freezers containing blood or OPIM
- Any container used to ship, store or transport blood or OPIM

Containers carrying blood or OPIM must be labeled using a fluorescent orange or orange-red label with the biohazard symbol and lettering in a contrasting color. Labels should be attached so that they cannot be removed or accidentally fall off. Red bags or red containers may be used as temporary substitutes for labels.

The employer must post warning signs (the biohazard symbol) at the entrance to HIV and HBV research laboratories and production facilities, and as specified by the Standard.

Hand Washing

Proper hand washing technique can prevent mucous membranes from being exposed to bloodborne pathogens when rubbing the eyes, nose or mouth. If hands are not washed properly, BBP can be transferred to surfaces, and eventually, to other people.

Wash hands as soon as possible after performing tasks that may expose you to BBP (e.g. providing medical aid, cleaning a blood spill, handling regulated waste).

Good hand washing technique:

- Wet hands with warm water and apply soap.
  - Use liquid soap to reduce the bacteria associated with bar soap.
- Rub hands together vigorously and scrub all surfaces, including under nail beds and between fingers.
- Continue scrubbing for at least 20 seconds. Soap combined with friction (scrubbing) removes germs.
- Rinse well with warm water and dry hands.

If hand washing facilities are not immediately available, use a hand sanitizer that contains at least 60% alcohol as a temporary solution. Wash hands properly at the earliest opportunity.

Hygiene

Use good personal hygiene and common sense to reduce your risk of exposure.

Food storage:

- Do not store food or eat in areas where BBP may be present.

Personal hygiene:

- Do not apply makeup or lip balm, smoke, eat, drink or handle contact lenses in areas of potential exposure.

Creams:

- Do not use petroleum-based creams, because they can deteriorate latex gloves.

Use Caution:

- Be careful around potentially infectious materials.
  - Use PPE at all times.
  - Minimize splashing or spattering of droplets of blood or OPIM.

Maintenance and Housekeeping

Reduce exposure to BBP by maintaining a safe work area and following good housekeeping techniques. Refer to your company's Exposure Control Plan for detailed information.

- Clean and disinfect equipment and work areas at the beginning and end of each shift.
- Remove and replace any coverings to equipment that have been exposed.
- Clean spills immediately.
- Pick up sharps properly and dispose of them as soon as possible.
- Use the proper containers for sharps, regulated waste, and contaminated laundry.
- Handle infectious materials and containers as little as possible.
- Ensure containers are labeled with a biohazard symbol.

Hepatitis B Vaccination

The HBV vaccination is the most effective method to reduce the risk of HBV transmission.

Employees at-risk for exposure to BBP as part of their job are eligible for the HBV vaccination. It is provided at no cost to the employee, and must be offered within 10 days of being classified as at-risk, after appropriate training has been completed.

Employees who refuse the vaccination must sign a hepatitis B vaccine declination form. They may choose to begin the HBV vaccination series at any time in the future.

Responding to Emergencies

Any time you provide emergency care, there is a risk of exposure to BBP. Always put your own safety first.

Universal and Standard Precautions

Universal Precautions are designed to prevent the transmission of BBP when providing medical aid or handling blood or OPIM. Treat all blood and body fluids as infectious, even when you do not suspect an infectious disease.

For additional protection, follow **Standard Precautions** and treat every body fluid as potentially infectious. This includes all body fluids, secretions and excretions, except sweat; non-intact skin; mucous membranes.

For the most protection:

- Assume all moist body substances are infectious.
- Wash hands thoroughly before and after each patient contact.
- Put on PPE before providing medical aid.
- Use CPR barrier devices for rescue breathing.
- Follow the Exposure Control Plan for cleaning and disposal of blood and OPIM.

What If You're Exposed on the Job?

If an exposure incident occurs, **immediately wash hands and exposed areas with soap and water.** Flush splashes to the nose or mouth with water, and irrigate eyes thoroughly with water or saline.

Follow your workplace Exposure Control Plan.

- Dispose of contaminated PPE, clothing or objects.
- Ensure the clean-up of any blood spill.
- Report the incident immediately to your supervisor.

Postexposure evaluation and follow-up is provided free to the employee within 3-4 hours:

1. Document the routes and circumstances of the exposure
2. Identify and document the source individual (unless prohibited by law)
3. Confidential medical evaluation by a qualified physician
4. Lab testing of the source and person exposed, with retesting as needed
5. Treat the exposure
6. Postexposure medications as needed
7. Employee counseling
8. Continued follow-up as needed

Exam

1. The purpose of the Bloodborne Pathogens Standard is to increase awareness about bloodborne pathogens, reduce the risk and occurrence of exposures, and provide guidelines on recognition and management of bloodborne pathogens in the workplace.

True / False

2. When no commercial germicides are available to clean a blood spill, the preferred solution is a mix of 1 part chlorinated _____ to 10 - 100 parts water.

3. _____ is a vaccine-preventable disease associated with liver failure and can be contracted by exposure to bloodborne pathogens.

4. Name three possible routes of entry for bloodborne pathogens:

_____, _____, _____.

5. If a person states that he or she is not infectious, it is okay not to use gloves while treating an illness or injury.

True / False

6. Three examples of viruses that can enter the body via fluid-to-fluid transmission are _____, _____, and _____,

7. OPIM stands for _____, _____, _____, _____,

8. Body fluids and tissues other than blood are considered to be OPIM and are to be treated the same as blood.

True / False

9. Three examples of personal protective equipment, or PPE, include _____, _____, and _____.

10. An organization's written manual which assesses who is at risk for exposure, how to prevent an exposure, what to do if one occurs, and provides guidelines for postexposure follow-up is known as the _____ _____ _____.

Exam

11. Sharp objects exposed to blood and body fluids may be picked up carefully by hand.
    True / False

12. Sharp objects should be placed in a properly labeled, puncture-resistant container.
    True / False

13. Regulated waste may be thrown out with the regular trash.
    True / False

14. When labeling a container of regulated waste, the proper symbol to utilize is the _____ symbol.

15. Put the following in the correct sequence by indicating 1, 2 or 3 on the line provided next to the corresponding actions to take if you are exposed to a bloodborne pathogen at work.
    _____ Have a full medical evaluation.
    _____ Report the exposure.
    _____ Clean the exposed area and provide first aid as needed.

16. Before donning protective gloves, check for holes or tears in the gloves, and bandage any cuts on your fingers.
    True / False

17. The bloodborne pathogen that affects the immune system is known as _____.

18. A laboratory worker accidentally cuts himself through his gloved hand with a contaminated sharp object. There is a small puncture wound with no bleeding. The contaminated sharp object is from an elderly person with no known medical history of contagious disease. Due to the medical history of the patient and the lack of bleeding, this is not an exposure, and does not need to be reported.
    True / False

Quality Training Programs:

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