

Bloodborne Pathogens

2.0 contact hours - \$15.00

Course Expires: June 1, 2012

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Course Objectives

When you finish this course, you will be able to:

- Explain the importance of bloodborne pathogens in the transmission of chronic and life-threatening diseases.
- Outline the actions employers are required to take to protect their employees from bloodborne pathogens.
- Describe the safe handling and disposal of sharps.
- Review the selection and use of personal protective equipment.
- State the procedure for reporting an exposure incident.
- Explain the importance of hepatitis B vaccination for healthcare personnel.
- Spell out the reasons for cleaning and decontaminating work areas.

Introduction

Bloodborne pathogens are infectious materials in blood and other body fluids that can cause chronic and life-threatening disease in humans; these include hepatitis B and C viruses and human immunodeficiency virus, or HIV/AIDS. These three diseases represent a huge disease burden for the United States (see table). CDC estimates that more than a million people are living with HIV/AIDS in the United States and 56,000 new HIV infections occur each year. As many as one-third of these people may also be infected with hepatitis C (HCV), the most common chronic bloodborne infection in the United States. Viral hepatitis is the leading cause of liver cancer and the most common reason for liver transplants. In addition, HCV increases the risk of type 2 diabetes mellitus, already reaching epidemic proportions in this country.

Chronic Infectious Diseases in the United States, 2009

Disease	People infected	Annual new infections
HIV/AIDS	1,000,000	56,000
Hepatitis B	1.2 million	43,000
Hepatitis C	3.2 million	17,000

Source: CDC, 2009.

Preventing the transmission of bloodborne pathogens is essential to protect healthcare workers, patients, and the public. All healthcare workers, both licensed and non-licensed, risk exposure to bloodborne pathogens, whether they work in hospitals, nursing homes, home care, or correctional institutions.

In addition to hepatitis B, C, and HIV, bloodborne pathogens include hepatitis (HDV), malaria, syphilis, babesiosis, brucellosis, leptospirosis, arboviral infections, relapsing fever, Creutzfeldt-Jakob disease, adult T-cell leukemia/lymphoma (caused by HTLV-I), HTLV-I-associated myelopathy, diseases associated with HTLV-II, and viral hemorrhagic fever. (See Glossary at the end of the course.) Some of these diseases are extremely rare in the United States. However, today's global mobility of individuals and families means that rare diseases can travel to the United States. Therefore, healthcare workers in certain areas of the country should be aware of the risk of exposure to rare diseases as well as those common to the United States.

An estimated 800,000 needle sticks and other sharps injuries, called percutaneous injuries (PIs), are reported each year but doctors believe that even more such injuries go unreported. Researchers at Johns Hopkins University reported that nearly 60 percent of medical school graduates surveyed had been stuck by a needle during medical school but half of them did not report the injury to hospital officials. The primary reason for not reporting was the amount of time and paperwork involved in making a report. Those surveyed had trained to become surgeons at seventeen medical centers in the United States (Sharma et al., 2009).

Sharps injuries and bloodborne infections are a major concern for nurses. Two-thirds of nurses report being accidentally stuck by a needle while working, and three-fourths of them were contaminated needle sticks. Although the overwhelming majority of nurses knew the workplace protocol concerning needle stick injuries, only 7 out of 10 reported the incident (ANA, 2008).

Since the Needlestick Safety and Prevention Act of 2001 (public law 106-430), safety syringes are increasingly available in healthcare facilities. This legislation mandates that institutions conduct annual product reviews of sharps safety devices and that nurses be involved in the decision-making process. However two-thirds of the nurses surveyed stated that they do not have the opportunity to influence product selection in their workplace (ANA, 2008).

State legislation has been enacted in twenty-two states to improve healthcare worker safety related to needle sticks. These laws add provisions not included in the federal OSHA Bloodborne Pathogen standard and/or coverage of public employees not regulated by OSHA. These laws contain unique requirements such as surveillance programs, cost-benefit analyses, strict requirements for safety device use and the use of statewide advisory boards. Each state law differs as to the time frame for development of its related regulations and the date the laws and regulations become effective. The state-by-state provisions are available at <http://www.cdc.gov/niosh/topics/bbp/ndl-law.html>.

Work Areas of Special Concern

Research has identified home care and correctional institutions as work areas with increased risk of bloodborne pathogen transmission. Work practices like extended work schedules and understaffing also increases the risk of percutaneous injuries (Trinkoff et al., 2007).

Home Care

Earlier discharge from hospitals means that patients are going home “sicker and quicker,” and may have health needs that demand complex nursing skills. Studies show that both RNs and aides/personal care assistants (PCAs) are experiencing PIs at significant levels. One study found that 14 percent of RNs reported one or more PIs in the past three years. These PIs were correlated with lack of compliance with Standard Precautions, recapping of needles, exposure to household stressors, exposure to violence, and mandatory overtime (Gershon et al., 2009).

Another study found that PCAs are at increased risk when performing nursing-related activities for which they are inexperienced and/or lack training (Lipscomb et al., 2009). A third study showed that 35 percent of nurses and 6.4 percent of aides experienced at least one sharps injury during their home healthcare career. Procedures contributing to PIs were injecting medications, administering finger sticks and heel sticks, and drawing blood. Sharps disposal, contact with waste, and patient handling also contributed to PIs. Sharps with safety features were not used much (Quinn et al., 2009). Two of the studies found that nearly half of the PIs were not formally reported.

Another study evaluated the experiences of 355 home healthcare nurses and 30 Medicare Certified Home Healthcare Agency and hospice employers in one state and found that employer policies and nurse practice were out of compliance with OSHA Bloodborne Pathogens Standard. Thirty-eight home healthcare nurses from 12 of the 30 employers reported PIs within the past year but the employers reported only 18 PIs in that same year (Scharf et al., 2009). More effective education, training, and enforcement of OSHA standards are needed to reduce the incidence of PIs in these areas of practice.

Correctional Institutions

All healthcare workers risk occupational exposure to bloodborne pathogens but those who work in correctional facilities face additional challenges:

- Jails and prisons can be unpredictable work settings.
- Security issues are often a higher priority than infection control.
- Inmates may have a higher rate of bloodborne diseases. The rate of AIDS in prison is 2.5 times the rate in the U.S. general population (U.S. Dept of Justice, 2009)

Correctional healthcare workers may be bitten or stabbed during an inmate assault, punctured with a used needle, or splashed in the face with blood. Any of these situations can expose workers to bloodborne diseases (CDC/NIOSH, 2009).

Education and training of correctional healthcare workers is essential to prevent exposure in these high-risk work settings. Compliance with the OSHA Bloodborne Pathogens Standard can protect healthcare workers as well as the populations they serve.

Overview of OSHA Bloodborne Pathogen Regulations

The Occupational Safety Health Administration's (OSHA) Bloodborne Pathogens standard, published in Title 29 of the Code of Federal Regulations 1910.1030, details what employers must do to protect workers whose jobs put them at a reasonable risk of coming into contact with blood and OPIM. The standard requires employers to take steps to protect employees from exposure to bloodborne pathogens (OSHA, 2004).

Bloodborne pathogens include any human pathogen present in OPIM (OPIM), which includes:

- Human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids
- Any unfixed tissue or organ (other than intact skin) from a human (living or dead)
- 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 (OSHA, 2008)

Most exposures do not result in infection. However, the risk of infection varies depending upon the pathogen involved, the type of exposure, the amount of blood involved in the exposure, and the amount of virus in the patient's blood at the time of exposure (CDC, 2003).

Precautions involve the use of protective barriers to reduce the risk of exposure of the employee's skin or mucous membranes to potentially infectious material. Healthcare workers should take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices (WSDOH, 2007).

Both Universal and Standard Precautions apply to blood and OPIM. **Universal Precautions** is a system designed to prevent transmission of bloodborne pathogens in healthcare and other settings. Under Universal Precautions, blood or OPIM of all patients should always be considered potentially infectious. **Standard Precautions** is a newer system that combines the major features of Universal Precautions and Body Substance Isolation (BSI) and is based on the principle that all blood, body fluids, secretions (except sweat), nonintact skin, and mucous membranes may contain transmissible infectious agents (CDC, 2007).

Preventing Exposure to Bloodborne Pathogens

The transmission of bloodborne pathogens can be minimized and even prevented by using safer techniques (for example, not recapping needles by hand), disposing of used needles in appropriate sharps disposal containers, and using medical devices with safety features designed to prevent injuries. Using appropriate barriers such as gloves, eye and face protection, or gowns when contact with blood is expected can prevent many exposures to the eyes, nose, mouth, or skin (CDC, 2003).

Exposure Control Plan

Employers are required to create a written exposure control plan (ECP) to eliminate or minimize employee exposures. The plan must be updated annually to reflect technological changes that help eliminate or reduce exposure to bloodborne pathogens. In the plan, employers must include information about the infection control system used in the workplace. It should contain annual documentation of consideration and implementation (if feasible) of appropriate, commercially available **safer medical devices** designed to eliminate or minimize occupational exposure. Employers must also document that they have solicited input from frontline workers in identifying, evaluating, and selecting engineering controls (OSHA, 2004).

The exposure control plan should also include a written **exposure determination** that includes those job classifications and positions in which employees have the potential for occupational exposures. The exposure determination should be made without taking into consideration the use of personal protective clothing or equipment. It is important to include those employees who are required or expected to administer first aid (WSDOH, 2007).

The procedure for evaluating the circumstances surrounding exposure incidents should include maintenance of a "sharps injury log" (WSDOH, 2007). The information in the sharps injury log must be recorded and maintained so that it protects the confidentiality of the injured employee. The log shall contain, at a minimum, the following:

- Type and brand of device involved in the incident
- Department or work area where the incident occurred
- Explanation of how the incident occurred

Finally, an employer should have in place a system for reporting exposures in order to evaluate quickly the risk of infection, inform employees about treatments available to help prevent infection, monitor side effects of treatments, and determine if infection occurs. This may involve testing the employee's blood and that of the source patient and offering appropriate **post-exposure prophylaxis (PEP)** (CDC, 2003).

Engineering Controls

Engineering controls are devices that isolate or remove the bloodborne pathogen hazard from the workplace. They include sharps disposal containers, self-sheathing needles, and safer medical devices such as sharps with engineered sharps-injury protection and needleless systems (OSHA, 2004).

Safer medical devices and work practices should be used in preference to personal protective equipment to minimize or eliminate employee exposure. There are now many safer medical devices available. Employers must include employees in ongoing evaluation of safer medical devices and implement these devices whenever feasible (WSDOH, 2007).

Evaluation and implementation of safer medical devices must be documented in the exposure control plan. Safer medical device lists can be accessed through websites maintained by the California Division of Occupational Safety and Health SHARP program, the National Association for the Primary Prevention of Sharps Injuries, and the International Healthcare Worker Safety Center (WSDOH, 2007).

Work Practice Controls

Work practice controls are practices that reduce the likelihood of exposure by changing the way a task is performed. They include appropriate procedures for hand washing, sharps disposal, lab specimen packaging, laundry handling, and contaminated material cleaning (OSHA, 2004).

Personal Protective Equipment (PPE)

The employer must provide personal protective equipment (PPE) and must clean, repair, and replace this equipment as needed (OSHA, 2004).

Gloves, masks, gowns, protective eyewear and chin-length plastic face shields are examples of personal protective equipment. PPE shall be provided and worn by employees in all instances where they will or may come into contact with blood or other potentially infectious material. This includes, but is not limited to dentistry, phlebotomy or processing of any bodily fluid specimen, and postmortem (after death) procedures (WSDOH, 2007).

Traditionally, latex gloves are used when dealing with blood or other potentially infectious material. However, there have been documented cases of people with allergies to latex. In most circumstances, nitrile, vinyl and other glove alternatives meet the definition of "appropriate" gloves and may be used in place of latex gloves. Employers are required to provide non-latex alternatives to employees with sensitivities to latex and other materials. Reusable PPE must be cleaned and decontaminated, or laundered by the employer (WSDOH, 2007).

Lab coats and scrubs are generally worn as uniforms or personal clothing. When contamination is reasonably likely, protective gowns should be worn. If lab coats or scrubs are worn as PPE, they must be removed as soon as practical and laundered by the employer (WSDOH, 2007).

Hepatitis B Vaccination

The employer must make available hepatitis B vaccinations to all employees with occupational exposure to bloodborne pathogens within 10 days of assignment (OSHA, 2004).

Post-Exposure Followup

Employers must provide post-exposure followup to any worker who experiences an exposure incident, at no cost to the worker. This includes conducting laboratory tests; providing confidential medical evaluation, identifying and testing the source individual, if feasible; testing the exposed employee's blood, if the worker consents; performing post-exposure prophylaxis (PEP); offering counseling; and evaluating reported illnesses. All diagnoses must remain confidential (OSHA, 2004).

Labels and Signs to Communicate Hazards

The standard requires warning labels affixed to containers of regulated waste, refrigerators and freezers, and other containers used to store or transplant blood or OPIM. Facilities may use red bags or containers instead of labels. Employers also must post signs to identify restricted areas (OSHA, 2004).

Tags and labels are required to protect employees from exposure to potentially hazardous biological agents. Tags must contain a **signal word** or symbol and a major message. The signal word shall be "**BIOHAZARD**", or the biological hazard symbol. The major message must indicate the specific hazardous condition or the instruction to be communicated to the employee (WSDOH, 2007).

The signal word must be readable at a minimum of five feet or such greater distance as warranted by the hazard. The tag's major message must be presented in either pictographs, written text, or both. The signal word and the major message must be understandable to all employees who may be exposed to the identified hazard. All employees must be informed as to the meaning of the various tags used throughout the workplace and what special precautions are necessary (WSDOH, 2007).

OSHA mandates that the employer shall post a biohazard sign at all entrances to work areas where there is a risk of exposure to bloodborne pathogens.



In addition, the sign should bear the following legend:

- (Name of the infectious agent)
- (Special requirements for entering the area)
- (Name, telephone number of the laboratory director or other responsible person)

From: US Dept of Labor, OSHA: Occupational Safety and Health Standards, Regulations for Bloodborne Pathogens. Standard 1910.1030.

Information and Training for Employees

All new employees or employees being transferred into jobs involving tasks or activities with potential exposure to blood or OPIM are required to receive training prior to assignment to tasks where occupational exposure may occur. Training typically includes information on the **hazards** associated with blood and other potentially infectious material, the **protective measures** to be taken to minimize the risk of occupational exposure, and **information** on the appropriate actions to take if an exposure occurs.

Retraining is required annually, or when changes in procedures or tasks affecting occupational exposure occur. Employees must be provided access to a qualified trainer during the training session to ask and have answered questions as they arise (WSDOH, 2007).

Employers must ensure that their workers receive regular training that covers the dangers of bloodborne pathogens, preventive practices, and post-exposure procedures. Employers must offer this training on initial assignment, then at least annually. In addition, laboratory and production facility workers must receive specialized initial training (OSHA, 2004).

The employer also must maintain a sharps injury log unless classified as an exempt industry under OSHA's standard on Recording and Reporting Occupational Injuries and Illnesses (OSHA, 2004).

Handling Sharps

A needlestick or a cut from a contaminated scalpel can lead to infection from hepatitis B virus (HBV) or human immunodeficiency virus (HIV), which causes AIDS.

Although few cases of HIV/AIDS have been documented from occupational exposure, approximately 8,700 healthcare workers each year contract hepatitis B. About 200 will die as a result. The new OSHA standard covering bloodborne pathogens specifies measures to reduce these risks of infection (OSHA, 2004).

Prompt Disposal

The best way to prevent cuts and sticks is to minimize contact with sharps. That means disposing of them immediately after use. Puncture-resistant containers must be available nearby to hold contaminated sharps—either for disposal or, for reusable sharps, later decontamination for re-use. When reprocessing contaminated reusable sharps, employees must not reach by hand into the holding container. Contaminated sharps must never be sheared or broken (OSHA, 2004).

Recapping, bending, or removing needles is permissible only if there is no feasible alternative or if required for a specific medical procedure such as blood gas analysis. If recapping, bending, or removal is necessary, workers must use either a mechanical device or a one-handed technique. If recapping is essential—for example, between multiple injections for the same patient--employees must avoid using both hands to recap.

Employees might recap with a one-handed "scoop" technique, using the needle itself to pick up the cap, pushing cap and sharp together against a hard surface to ensure a tight fit. Or they might hold the cap with tongs or forceps to place it on the needle (OSHA, 2004).

Sharps Containers

Containers for used sharps must be puncture resistant. The sides and the bottom must be leak-proof. They must be labeled or color coded red to ensure that everyone knows the contents are

hazardous. Containers for disposable sharps must have a lid, and they must be maintained upright to keep liquids and the sharps inside (OSHA, 2004).

Employees must never reach by hand into containers of contaminated sharps. Containers for reusable sharps could be equipped with wire basket liners for easy removal during reprocessing, or employees could use tongs or forceps to withdraw the contents. Reusable sharps disposal containers may not be opened, emptied, or cleaned manually (OSHA, 2004).

Containers need to be located as near to as feasible the area of use. In some cases, they may be placed on carts to prevent access by mentally disturbed or pediatric patients. Containers also should be available wherever sharps may be found, such as in laundries. The containers must be replaced routinely and not be overfilled, which can increase the risk of needle sticks or cuts (OSHA, 2004).

Handling Containers

When employees are ready to discard containers they should first close the lids. If there is a chance of leakage from the primary container, the employees should use a secondary container that is closable, labeled, or color coded and leak resistant. Careful handling of sharps can prevent injury and reduce the risk of infection. By following these work practices, employees can decrease their chances of contracting bloodborne illness (OSHA, 2004).

Personal Protective Equipment

Wearing gloves, gowns, masks, and eye protection can significantly reduce health risks for workers exposed to blood and OPIM. The current OSHA standard covering bloodborne disease requires employers to provide appropriate personal protective equipment (PPE) and clothing free of charge to employees (OSHA, 2004).

Workers who have direct exposure to blood and OPIM on their jobs run the risk of contracting bloodborne infections from hepatitis B virus (HBV), human immunodeficiency virus (HIV) which causes AIDS, and other pathogens. About 8,700 healthcare workers each year are infected with HBV, and 200 die from the infection. Although the risk of contracting HIV/AIDS through occupational exposure is much lower, wearing proper personal protective equipment can greatly reduce potential exposure to all bloodborne infections (OSHA, 2004).

Selecting PPE

Personal protective clothing and equipment must be appropriate for the level of protection needed for the expected exposure. For example, gloves would be sufficient for a laboratory technician who is drawing blood, whereas a pathologist conducting an autopsy would need considerably more protective clothing (OSHA, 2004).

PPE may include gloves, gowns, laboratory coats, face shields or masks, eye protection, pocket masks, and other protective gear. The gear must be readily accessible to employees and available in appropriate sizes. If employees are expected to have hand contact with blood or OPIM or contaminated surfaces, they must wear gloves. Single use gloves cannot be washed or decontaminated for reuse. Utility gloves may be decontaminated if they are not compromised. They should be replaced when they show signs of cracking, peeling, tearing, puncturing, or deteriorating. If employees are allergic to standard gloves, the employer must provide hypoallergenic gloves or similar alternatives (OSHA, 2004).

Routine gloving is not required for phlebotomy in voluntary blood donation centers, though it is necessary for all other phlebotomies. In any case, gloves must be available for employees who want to use them. Workers in voluntary blood donation centers must use gloves (1) when they have cuts, scratches or other breaks in their skin, (2) while they are in training, and (3) when they believe contamination might occur (OSHA, 2004).

Employees should wear eye and mouth protection such as goggles and masks, glasses with solid side shields, and masks or chin-length face shields when splashes, sprays, splatters, or droplets of OPIM pose a hazard through the eyes, nose, or mouth. More extensive coverings such as gowns, aprons, surgical caps and hoods, and shoe covers or boots are needed when gross contamination is expected. This often occurs, for example, during orthopedic surgery, labor and delivery, or autopsies (OSHA, 2004).

Employers must provide the PPE and ensure that their workers wear it. This means that if a lab coat is considered PPE, it must be supplied by the employer rather than the employee. The employer also must clean or launder clothing and equipment and repair or replace it as necessary. Additional protective measures such as using PPE in animal rooms and decontaminating PPE before laundering are essential in facilities that conduct research on HIV or HBV (OSHA, 2004).

Exception

There is one exception to the requirement for protective gear. An employee may choose, temporarily and briefly, under rare and extraordinary circumstances, to forego the equipment. It must be the employee's professional judgment that using the protective equipment would prevent the delivery of healthcare or public safety services or would pose an increased hazard to the safety of the worker or co-worker. When one of these excepted situations occurs, employers are to investigate and document the circumstances to determine if there are ways to avoid it in the future. For example, if a firefighter's resuscitation device is damaged, perhaps another type of device should be used or the device should be carried in a different manner. Exceptions must be limited--this is not a blanket exemption (OSHA, 2004).

Decontaminating and Disposing Of PPE

Employees must remove personal protective clothing and equipment before leaving the work area or when the PPE becomes contaminated. If a garment is penetrated, workers must remove it immediately or as soon as feasible. Used protective clothing and equipment must be placed in designated containers for storage, decontamination, or disposal (OSHA, 2004).

Other Protective Practices

If an employee's skin or mucous membranes come into contact with blood, he or she is to wash with soap and water and flush eyes with water as soon as feasible. In addition, workers must wash their hands immediately or as soon as feasible after removing protective equipment. If soap and water are not immediately available, employers may provide other handwashing measures such as moist towelettes. Employees still must wash with soap and water as soon as possible (OSHA, 2004).

Employees must refrain from eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses in areas where they may be exposed to blood or OPIM (OSHA, 2004).

Reporting Exposure Incidents

An **occupational exposure** is defined as a percutaneous injury such as a needlestick or cut with a sharp object or contact of mucous membrane or non-intact skin (e.g., exposed skin that is chapped, abraded, or afflicted with dermatitis) with blood, tissue, or OPIM. The CDC states that the risk of infection varies case by case. Factors influencing the risk of infection include:

- Whether the exposure was from a hollow-bore needle or other sharp instrument
- Whether the exposure was to non-intact skin or mucous membranes such as the eyes, nose, or mouth
- The amount of blood that was involved and the amount of virus present in the source's blood

OSHA's current bloodborne pathogens standard includes provisions for medical follow-up for workers who have an exposure incident. The most obvious exposure incident is a needle stick. But any specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or OPIM is considered an exposure incident and should be reported to the employer (OSHA, 2004).

Exposure incidents can lead to infection from hepatitis B virus (HBV) or human immunodeficiency virus (HIV). Although few cases of HIV/AIDS are directly traceable to workplace exposure, every year about 8,700 healthcare workers contract hepatitis B from occupational exposures. Approximately 200 will die from this bloodborne infection. Some will become carriers, passing the infection on to others (OSHA, 2004).

Reporting

Reporting an exposure incident right away permits immediate medical follow-up—early action is crucial. Immediate intervention can forestall the development of hepatitis B or enable the affected worker to track potential HIV infection. Prompt reporting also can help the worker avoid spreading bloodborne infection to others. Further, it enables the employer to evaluate the circumstances surrounding the exposure incident to try to find ways to prevent such a situation from occurring again (OSHA, 2004).

Reporting is also important because part of the follow-up includes testing the blood of the source individual to determine HBV and HIV infectivity if this is unknown and if permission for testing can be obtained. There are now at least four FDA-approved tests available for rapid HIV antibody testing, which can confirm negative HIV status within an hour after blood is drawn from a source individual. An employer's failure to use rapid HIV antibody testing of the source individual could be considered a violation of paragraph 1910.1030(f)(3)(ii)(A) in the OSHA standard (OSHA, 2007). The exposed employee must be informed of the results of these tests. Employers must tell the employee what to do if an exposure incident occurs (OSHA, 2004).

Follow the protocol of your employer. After cleansing the exposed area, report the exposure to the department or individual at your workplace who is responsible for managing exposure. Obtain medical evaluation as soon as possible. Discuss the extent of the exposure, treatment, follow-up care, personal prevention measures, the possible need for a tetanus shot and other care. Your employer is required to provide an appropriate post-exposure management referral at no cost to you. In addition, your employer should provide the following information to the evaluating healthcare professional:

- A description of the job duties the exposed employee was performing when exposed.
- Documentation of the routes of exposure and circumstances under which exposure occurred.
- Results of the source person's blood testing, if available.
- All medical records that you are responsible to maintain, including vaccination status, relevant to the appropriate treatment of the employee (WSDOH, 2007).

Note: HIV and hepatitis infection are **notifiable conditions**.

Medical Evaluation and Follow-Up

Employers must provide free medical evaluation and treatment to employees who experience an exposure incident. Employers are to refer exposed employees to a licensed healthcare provider who will counsel the individual about what happened and how to prevent further spread of any potential infection. He or she will prescribe appropriate treatment in line with current U.S. Public Health Service recommendations. The licensed healthcare provider also will evaluate any reported illness to determine if the symptoms may be related to HIV or HBV development (OSHA, 2004).

The first step is to test the blood of the exposed employee. Any employee who wants to participate in the medical evaluation program must agree to have blood drawn. However, the employee has the option to give the blood sample but refuse permission for HIV testing at that time. The employer must maintain the employee's blood sample for 90 days in case employees change their mind about testing—should symptoms develop that might relate to HIV or HBV infection (OSHA, 2004).

The healthcare provider will counsel the employee based on the test results. If the source individual was HBV positive or in a high risk category, the exposed employee may be given hepatitis B immune globulin and vaccination, as necessary. If there is no information on the source individual or the test is negative, and the employee has not been vaccinated or does not have immunity based on testing, the vaccine may be given. Further, the healthcare provider will discuss any other findings from the tests (OSHA, 2004).

The standard requires that the employer make the hepatitis B vaccine available, at no cost to the employee, and to all employees who have occupational exposure to blood and OPIM. This requirement is in addition to post exposure testing and treatment responsibilities (OSHA, 2004).

Post-Exposure Prophylaxis

Post-exposure prophylaxis (PEP) provides anti-HIV medications to someone who has had a substantial exposure, usually to blood. PEP has been the standard of care for occupationally exposed healthcare workers with substantial exposures since 1996. Animal models suggest that

cellular HIV infection happens within 2 days of exposure to HIV and the virus in blood is detectable within 5 days. Therefore, PEP should be started as soon as possible, within hours not days, after exposure and continued for 28 days. However, PEP for HIV does not provide prevention of other blood-borne diseases, like HBV or HCV. HBV PEP for susceptible persons would include administration of hepatitis B immune globulin and HBV vaccine. This should occur as soon as possible and no later than 7 days post-exposure (WSDOH, 2007).

The benefit of the use of antiviral agents to prevent HCV infection is unknown and antiviral drugs are not currently FDA-approved for prophylaxis. Because of the frequent advances in treatment, doses and medications are not listed here. Post-exposure prophylaxis can only be obtained from a licensed healthcare provider. Your facility may have recommendations and a chain of command in place for you to obtain PEP. After evaluation of the exposure route and other risk factors, certain anti-HIV medications may be prescribed. The national bloodborne pathogen hotline provides 24-hour consultation for clinicians who have been exposed on the job. Call 1-888-448-4911 for the latest information on prophylaxis for HIV, hepatitis, and other pathogens (WSDOH, 2007).

PEP is not as simple as swallowing one pill. The medications must be started as soon as possible, and continued for 28 days. Many people experience significant medication side effects. It is very important to report occupational exposure to the department at your workplace that is responsible for managing exposure. If post-exposure treatment is recommended, it should be started as soon as possible. In rural areas, police, firefighters and other at-risk emergency providers should identify a 24-hour source for PEP (WSDOH, 2007).

In some states, workers have a right to file a worker's compensation claim for exposure to bloodborne pathogens. Industrial insurance may cover the cost of post-exposure prophylaxis and follow-up for the injured worker (WSDOH, 2007).

Written Opinion

In addition to counseling the employee, the healthcare provider will provide a written report to the employer. This report simply identifies whether hepatitis B vaccination was recommended for the exposed employee and whether or not the employee received vaccination. The employer must provide a copy of the report to the employee within 15 days of the completion of the evaluation. The healthcare provider also must note that the employee has been informed of the results of the evaluation and told of any medical conditions resulting from exposure to blood which require further evaluation or treatment. Any added findings must be kept confidential (OSHA, 2004).

Confidentiality

Medical records must remain confidential. They are not available to the employer. The employee must give specific written consent for anyone to see the records. Records must be maintained for the duration of employment plus 30 years in accordance with OSHA's standard on access to employee exposure and medical records (OSHA, 2004).

This is one of a series of fact sheets that discusses various requirements of the Occupational Safety and Health Administration's standard covering exposure to bloodborne pathogens. Single copies of fact sheets are available from OSHA Publications, Room N-3101, 200 Constitution Avenue, N. W., Washington, DC 20210 and from OSHA regional offices (OSHA, 2004).

Hepatitis B Vaccination

The OSHA standard covering bloodborne pathogens requires employers to offer the three-injection vaccination series free to all employees who may be exposed to blood or OPIM as part of their job duties. This includes healthcare workers, emergency responders, morticians, first-aid personnel, law enforcement officers, correctional facilities staff, launderers, as well as others. The vaccination must be offered within 10 days of initial assignment to a job where exposure to blood or OPIM can be "reasonably anticipated" (OSHA, 2004).

Hepatitis B Virus

Hepatitis B virus (HBV) is a potentially life-threatening bloodborne pathogen. The Centers for Disease Control estimate there are approximately 43,000 HBV infections each year in the United States. In addition, some who contract HBV will become carriers, passing the disease on to others. Carriers also face a significantly higher risk for other liver ailments that can be fatal, including cirrhosis of the liver and primary liver cancer (OSHA, 2004).

HBV infection is transmitted through exposure to blood and other infectious body fluids and tissues. Anyone with occupational exposure to blood is at risk of contracting the infection. Employers must provide engineering controls; workers must use work practices and protective clothing and equipment to prevent exposure to potentially infectious materials. However, the best defense against hepatitis B is vaccination (OSHA, 2004).

Vaccination Process

The hepatitis B vaccination is a noninfectious, yeast-based vaccine given in three injections in the arm. It is prepared from recombinant yeast cultures, rather than human blood or plasma. Thus, there is no risk of contamination from other bloodborne pathogens nor is there any chance of developing HBV from the vaccine. The second injection should be given one month after the first, and the third injection six months after the initial dose. More than 90 percent of those vaccinated will develop immunity to the hepatitis B virus (OSHA, 2004).

To ensure immunity, it is important for individuals to receive all three injections. At this point it is unclear how long the immunity lasts, so booster shots may be required at some point in the future. The vaccine causes no harm to those who are already immune or to those who may be HBV carriers. Although employees may choose to have their blood tested for antibodies to determine need for the vaccine, employers may not make such screening a condition of receiving vaccination nor are employers required to provide prescreening.

Each employee should receive counseling from a healthcare professional when vaccination is offered. This discussion will help an employee determine whether inoculation is necessary (OSHA, 2004).

Declining the Hepatitis B Vaccination

Workers who decide to decline vaccination must complete a declination form. Employers must keep these forms on file so that they know the vaccination status of everyone who is exposed to blood. At any time after a worker initially declines to receive the vaccine, he or she may choose to take it (OSHA, 2004).

Unvaccinated Individuals

If an unvaccinated worker experiences an exposure incident such as a needlestick or a blood splash in the eye, he or she must receive confidential medical evaluation from a licensed healthcare professional with appropriate follow-up. To the extent possible by law, the employer is to determine the source individual for HBV as well as human immunodeficiency virus (HIV) infectivity. The worker's blood will also be screened if he or she agrees (OSHA, 2004).

The healthcare professional is to follow the guidelines of the U.S. Public Health Service in providing treatment. This would include hepatitis B vaccination. The healthcare professional must give a written opinion on whether or not vaccination is recommended and whether the employee received it. Only this information is reported to the employer. Employee medical records must remain confidential. HIV or HBV status must NOT be reported to the employer (OSHA, 2004).

Contamination

Keeping work areas in a clean and sanitary condition reduces employees' risk of exposure to bloodborne pathogens. The chance of contracting human immunodeficiency virus (HIV), the bloodborne pathogen which causes AIDS, from occupational exposure is small; yet a good housekeeping program can minimize this risk (OSHA, 2004).

Decontamination

Every employer whose employees are exposed to blood or OPIM must develop a written schedule for cleaning each area where exposures occur. The methods of decontaminating different surfaces must be specified, determined by the type of surface to be cleaned, the soil present and the tasks or procedures that occur in that area (OSHA, 2004).

For example, different cleaning and decontamination measures would be used for a surgical operatory and a patient room. Similarly, hard surfaced flooring and carpeting require separate cleaning methods. More extensive efforts will be necessary for gross contamination than for minor spattering. Likewise, such varied tasks as laboratory analyses and normal patient care would require different techniques for clean-up (OSHA, 2004).

Employees must decontaminate working surfaces and equipment with an appropriate disinfectant after completing procedures involving exposure to blood. Many laboratory procedures are performed on a continual basis throughout a shift. Except as discussed below, it is not necessary to clean and decontaminate between procedures. However, if the employee leaves the area for a period of time, for a break or lunch, then contaminated work surfaces must be cleaned (OSHA, 2004).

Employees also must clean (1) when surfaces become obviously contaminated; (2) after any spill of blood or OPIM; and (3) at the end of the work shift if contamination might have occurred. Thus, employees need not decontaminate the work area after each patient care procedure, but only after those that actually result in contamination (OSHA, 2004).

If surfaces or equipment are draped with protective coverings such as plastic wrap or aluminum foil, these coverings should be removed or replaced if they become obviously contaminated. Reusable receptacles such as bins, pails and cans that are likely to become contaminated must be inspected and decontaminated on a regular basis. If contamination is visible, workers must clean and decontaminate the item immediately, or as soon as feasible. Should glassware that may be

potentially contaminated break, workers need to use mechanical means such as a brush and dustpan or tongs or forceps to pick up the broken glass—never by hand, even when wearing gloves (OSHA, 2004).

Before any equipment is serviced or shipped for repairing or cleaning, it must be decontaminated to the extent possible. The equipment must be labeled, indicating which portions are still contaminated. This enables employees and those who service the equipment to take appropriate precautions to prevent exposure (OSHA, 2004).

Regulated Waste

In addition to effective decontamination of work areas, proper handling of regulated waste is essential to prevent unnecessary exposure to blood and OPIM. All regulated waste must be placed in closeable, leak proof containers or bags that are color-coded (red-bagged) or labeled to prevent leakage during handling, storage and transport. Disposal of waste shall be in accordance with federal, state and local regulations.

Regulated waste is:

- Liquid or semi-liquid blood or OPIM
- Contaminated items that would release blood or OPIM in a liquid or semi-liquid state if compressed
- Items that are caked with dried blood or OPIM and are capable of releasing these materials during handling
- Contaminated sharps
- Pathological and microbiological wastes containing blood or OPIM (OSHA, 2008)

Regulated waste must be handled with great care. Containers used to store regulated waste must be closable and suitable to contain the contents and prevent leakage of fluids. Containers designed for sharps also must be puncture resistant. They must be labeled or color-coded to ensure that employees are aware of the potential hazards. Such containers must be closed before removal to prevent the contents from spilling. If the outside of a container becomes contaminated, it must be placed within a second suitable container. Regulated waste must be disposed of in accordance with applicable state and local laws (OSHA, 2004).

Laundry

Laundry workers must wear gloves and handle contaminated laundry as little as possible, with a minimum of agitation. Contaminated laundry should be bagged or placed in containers at the location where it is used, but not sorted or rinsed there. Laundry must be transported within the establishment or to outside laundries in labeled or red color-coded bags. If the facility uses Universal Precautions for handling all soiled laundry, then alternate labeling or color coding that can be recognized by the employees may be used. If laundry is wet and it might soak through laundry bags, then workers must use bags that prevent leakage to transport it (OSHA, 2004).

Laundry that is or may be soiled with blood or OPIM, or may contain contaminated sharps, must be treated as though contaminated. Contaminated laundry must be bagged at the location where it was used, and shall not be sorted or rinsed in patient-care areas. It must be placed and transported in bags that are labeled or color-coded (red-bagged) (WSDOH, 2007).

All contaminated laundry must be cleaned or laundered so that any infectious agents are destroyed. Guidance regarding laundry handling and washing procedures in the healthcare setting can be found in the *CDC Guidelines for Environmental Infection Control in the Healthcare Facilities, 2003*.

Glossary

Hepatitis D (HDV)

A virus that causes hepatitis only in association with Hepatitis B. It occurs infrequently, usually through injection drug use, and can speed the progression to cirrhosis.

Brucellosis

A disease transmitted from cattle, hogs, and goats to humans through contact with infected meat, the placental tissue of infected animals, or ingestion of infected unpasteurized milk or cheese. It is rare in the United States except among slaughterhouse workers, farmers, and veterinarians.

Leptospirosis

An acute and often severe infection, generally transmitted from animals to humans by ingestion of food and drink contaminated by the urine of rats, dogs, cattle, or swine, or through minor skin lesions or the conjunctiva of the eye when rafting or swimming in contaminated waters. Some cases have been observed in homeless people exposed to rat urine.

Arboviral infections

These infections are transmitted to humans by arthropods (ticks and mosquitoes) and, once infected, humans can transmit the viruses to one another. West Nile virus is the leading cause of arbovirus encephalitis in the United States.

Relapsing fever

This disease is transmitted to humans by infected ticks and lice. It may be misdiagnosed as malaria, leptospirosis, yellow fever, or rat-bite fever, but can be treated effectively with antibiotics.

Creutzfeldt-Jakob disease

This is a chronic neurodegenerative disease characterized by dementia, myoclonic fasciculations (involuntary contraction or twitching of muscle groups), ataxia, and somnolence. One form of this disease is thought to be transmitted by ingestion of beef contaminated with neural tissue (brain and spinal cord) from cattle infected with bovine spongiform encephalopathy (BSE, or mad cow disease).

HTLV-1 and HTLV-2

Types of human T-cell leukemia viruses, occurring most commonly in the United States among injection drug users.

Viral hemorrhagic fever (VHF)

A group of illnesses caused by several distinct families of RNA viruses that reside in animals such as rodents and arthropods such as ticks and mosquitoes and are transmitted to humans who contact them. Once infected, humans can transmit the virus to one another. These viruses damage the vascular system and impair the body's ability to regulate itself. They are often accompanied by hemorrhage but the bleeding is rarely life-threatening. Although some types of VHFs cause mild disease, others such as Ebola virus can be life-threatening. They are geographically endemic to the area where the particular animal host lives but some hosts, such as the common rat, are distributed worldwide.

Resources

For more in-depth information about bloodborne pathogens visit OSHA at:

- Bloodborne Pathogens: www.osha.gov/SLTC/bloodbornepathogens
- Needle sticks: www.osha.gov/needlesticks and www.osha.gov/SLTC/needlestick

To file a complaint by phone, report an emergency, or get OSHA advice, assistance, or products, contact your nearest OSHA office under the “U.S. Department of Labor” listing in your phone book, or call us toll-free at (800) 321-OSHA (6742). The teletypewriter (TTY) number is (877) 889-5627.

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Post Test

Use the Answer Sheet following the test to record your answers.

1. Bloodborne pathogens:
 - a) Include lice and fleas that can be transmitted to another person by contact with contaminated bedding or clothes.
 - b) May be spread through contact with the intact skin of an infected person.
 - c) Are infectious materials in blood or body fluids that can cause disease in humans.
 - d) Cannot be spread through cerebral spinal fluid because the blood-brain barrier prevents passage of organisms into the spinal fluid.
2. The most common bloodborne infection in the United States is:
 - a) Malaria.
 - b) Creutzfeldt-Jakob disease.
 - c) HCV infection.
 - d) Syphilis.
3. Standard Precautions, a newer system designed to prevent transmission of bloodborne pathogens, considers all body fluids except sweat to be potentially infectious.
 - a) True
 - b) False
4. Employers are required to:
 - a) Create a written exposure control plan that must be updated every 2 years to minimize employee bloodborne pathogen exposures.
 - b) Make an exposure determination report that evaluates the effectiveness of personal protective equipment used by nurses.
 - c) Consider and implement appropriate, commercially available safer medical devices to eliminate or minimize occupational exposure.
 - d) Make an exposure determination on all patients who may be considered at risk for a bloodborne pathogen exposure.
5. Personal protective equipment:
 - a) Should be obtained and cleaned by employees who are in frequent contact with blood or other body fluids.
 - b) Include latex gloves, which have been shown to be the only type of glove that protects against bloodborne pathogens.
 - c) Are devices that isolate or remove the bloodborne pathogen hazard from the workplace.
 - d) Must be provided by the employer who is required to clean, repair and replace the equipment as needed.

6. Employers are required to:
 - a) Offer HIV prophylaxis to any employee with occupational exposure to bloodborne pathogens within 20 days of assignment.
 - b) Send an employee to their personal physician for post-exposure follow-up and possible medication at the employee's expense.
 - c) Provide post-exposure followup to any worker who experiences an exposure incident at no cost to the employee.
 - d) Notify families, co-workers and sexual partners of any exposure and positive diagnosis of HIV or hepatitis C.
7. Needles or contaminated sharps should:
 - a) Be disposed of immediately after use into puncture-resistant containers.
 - b) Always be recapped after use to prevent a needlestick.
 - c) Always be recapped using both hands if recapping is essential.
 - d) Be bent and broken prior to disposal to prevent needle sticks.
8. To decrease chance of contracting bloodborne illness:
 - a) Only those employees who are trained to empty sharps containers are allowed to reach by hand into the containers.
 - b) The containers must be replaced when filled to the top and the lids should not be closed.
 - c) Employees must never reach by hand into containers of contaminated sharps.
 - d) Sharps containers should be opened, emptied and cleaned manually.
9. Personal protective equipment:
 - a) Must be made available for sale to all employees who are at risk for contamination with bloodborne pathogens.
 - b) Must be readily accessible to employees, free of charge and available in appropriate sizes.
 - c) Such as gloves are required for phlebotomy in voluntary blood donation centers.
 - d) Must, without exception, be used by all employees who are at risk for contact with bloodborne pathogens.
10. Employees do not need to wash hands if gloves have been used when handling items contaminated with blood or body fluids.
 - a) True
 - b) False
11. An occupational exposure:
 - a) Is any skin contact with blood, tissue or OPIM.
 - b) Should be reported within a week of the event so that similar situations can be avoided in the future.
 - c) Is a percutaneous injury or contact of mucous membrane or non-intact skin with potentially infectious material.
 - d) Has often led to HIV infection in healthcare workers.

12. Following a bloodborne pathogen exposure:
 - a) The incident must be reported to the individual or department responsible for managing exposure within 7 days of that exposure.
 - b) The exposed area should be cleansed and the incident should be reported to the department or individual responsible for managing exposure.
 - c) The exposed person should make an appointment with their personal physician.
 - d) The blood of the source individual should be tested, but the results are confidential and the exposed employee does not have a legal right to the results.
13. An employee who has been exposed to blood or body fluids:
 - a) Is required to have HIV testing.
 - b) Must receive hepatitis B immune globulin and vaccination.
 - c) Must be offered the hepatitis B vaccine at no cost to the employee.
 - d) Should have his or her blood drawn 90 days after exposure to test for HIV.
14. Post-exposure prophylaxis or PEP:
 - a) Provides post-exposure protection for hepatitis B.
 - b) Provides anti-hepatitis B medication and should be started 28 days after a bloodborne pathogen exposure.
 - c) Provides anti- HIV medicine and must be started as soon as possible after an exposure and continued for 28 days.
 - d) Is as simple as swallowing one pill.
15. The hepatitis B vaccine:
 - a) Is a series of 4 injections that must be completed in order to ensure immunity.
 - b) May occasionally cause hepatitis B infection in the vaccinated person.
 - c) Should not be given to those who are already immune to or who may be HBV carriers.
 - d) Is a non-infectious yeast based vaccine given in 3 injections in the arm.
16. HIV and HBV status must be reported to employers.
 - a) True
 - b) False
17. Regulated waste:
 - a) Must be poured into flushable tanks.
 - b) Includes all items that have been in an HIV patient's room.
 - c) Must be decontaminated as much as possible before being shipped for repair or cleaning.
 - d) Must be placed in closeable, leak-proof containers that are color-coded.
18. Contaminated laundry should be bagged or placed in containers at the location where it is used, but not sorted or rinsed there.
 - a) True
 - b) False

Answer Sheet

Bloodborne Pathogens

Name (Please print your name): _____

Date: _____

Passing score is 80%

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____

Course Evaluation

Please answer each of the following questions. Questions with asterisks (*) are required.

* 1. This course met the goals and learning objectives.

- Yes No

* 2. The author was well prepared to write about the content in a way that facilitated my learning.

- Yes No

* 3. This course was free from commercial bias.

- Yes No

* 4. The learning activity met my continuing education needs.

- Yes No

* 5. The learning activity took me 60 minutes per contact hour. (If you answer "No", please enter the total time it took to finish the course, test, and evaluation.)

- Yes
 No**

** If your answer was "No", how long did it take to finish the course, test, and evaluation?

6. My professional educational level is (check one):

Nursing

- Nurse Aide LVN/LPN RN (diploma) RN (AD)
 BSN MSN Nurse Practitioner / Advanced Practice Nurse
 PhD / DNSc

Therapy

- OT Aide COTA OT MOT OTD
 PT Aide PTA PT MPT MSPT DPT PhD

Other (please specify): _____

(continued on next page)

7. I heard about ATrain Education from:

- | | |
|--|---|
| <input type="checkbox"/> Search engine | <input type="checkbox"/> Advertisement |
| <input type="checkbox"/> Government or Board website | <input type="checkbox"/> Returning customer |
| <input type="checkbox"/> Friend | <input type="checkbox"/> Publication (Magazine, etc.) |
| <input type="checkbox"/> Other _____ | |

8. I found the ATrainCEU.com website easy to use:

- Yes No

9. Comments or suggestions (optional): _____

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Please answer all of the following questions (*required).

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* Address: _____

* City: _____ State: _____ Zip: _____

* Phone: _____

* Professional Designation: _____

* License Number and State: _____

Please e-mail my certificate: Yes No

Email (required if you want your certificate sent by email): _____

(Note: If you request an email certificate we will not send a copy of your certificate by US Mail.)

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You may pay by credit card or by check. Fill out this section only if you are **paying by credit card**.
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Credit card information:

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City: _____ State: _____ Zip: _____

Card type: Visa MC American Express Discover

Card number _____

Expiration date _____

Test Completion and Mailing Instructions

1. Complete all forms:

- Answer Sheet
- Evaluation Learning Activity
- Registration Form (this page)

2. If you are **paying by check**, prepare a check for \$15 made out to ATrain Education, Inc.

3. Mail the completed forms and your payment to:

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Willits, CA 95490

Once we receive your forms and payment, we will mail (or email, if you request it) your certificate of completion. If you have any questions or concerns, please call or contact us at Sharon@ATrainCEU.com. And thanks for taking the ATrain!