

Lesson Plan Template

Name of Instructor: Megan Hardie
Lesson Title: OSHA Bloodborne Pathogens Standard (POS Task #404)
Lesson Performance Objective: Given a printed OSHA Bloodborne Pathogens article and worksheet, students will demonstrate understanding of OSHA standards, universal precautions, and exposure response procedures by completing the worksheet with at least 80% accuracy (24/30 points).
Time (length of lesson): FID #3
Equipment and Materials needed: Printed copy of assigned article (NCBI StatPearls OSHA Bloodborne Pathogens), POS 404 Worksheet/Assessment, student notebook, pencil/pen.
Introduction: Students will review the importance of workplace safety and infection prevention in healthcare. This assignment focuses on OSHA Bloodborne Pathogens Standards and how healthcare workers protect themselves and clients from exposure to infectious materials.
Body: <ol style="list-style-type: none">1. Read the provided article on OSHA Bloodborne Pathogens Standards.2. Complete the POS Task #404 worksheet questions (10 questions).3. Use complete sentences and refer directly to information from the reading.4. Submit the completed worksheet upon return to class. Submission counts as attendance for the remote day.
Summary: Students will reinforce key OSHA safety concepts including bloodborne pathogen risks, universal precautions, PPE use, sharps safety, and proper response to exposure incidents.
Assessment: Summative Assessment: Completed worksheet graded out of 30 points (3 points per question). Submission will count for attendance.

NCBI Bookshelf. A service of the National Library of Medicine, National Institutes of Health.

StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-.

OSHA Bloodborne Pathogen Standards

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Continuing Education Activity

Bloodborne pathogens are infectious microorganisms in human blood that can lead to serious disease. Health care workers and support staff are at increased risk of exposure to these pathogens. The Occupational Safety and Health Administration Bloodborne Pathogens Standard consists of regulations designed to protect occupationally exposed health care workers. This activity reviews the elements of the Bloodborne Pathogens Standard. It highlights the role of the interprofessional team in reducing or eliminating the risk of occupational exposure to infectious materials and a wide range of diseases.

Objectives:

- Identify the common bloodborne pathogens and method of transmission
- List and discuss the nature and frequency of blood contact and method of exposure to bloodborne diseases.
- Describe the tools for protecting healthcare personnel from bloodborne infections.
- Outline the elements of the bloodborne pathogens standard.

[Access free multiple choice questions on this topic.](#)

Introduction

Bloodborne pathogens are microorganisms in human blood that can cause life-threatening diseases and pose a severe risk to health care workers. Contact with blood or other fluids, including semen, vaginal secretions, saliva, and serous fluids – pleural, pericardial, peritoneal, and amniotic – clear or visibly contaminated with blood potential to transmit the pathogen and cause infectious disease. In the health care setting, bloodborne pathogens are often transmitted by percutaneous injury, accidental puncture, human bites, cuts, abrasions, or through mucocutaneous exposure to infected patient's fluids. In the workplace, the major source of bloodborne infections is percutaneous injuries from needles or other sharps.[1] Especially prone to exposure are medical professions involving frequent invasive procedures, a high volume of blood, and urgency of care. Health care workers in surgery, emergency medicine, critical care, labor and delivery, and dialysis units are most prone to occupational exposure. Other occupations with exposure risk include mortuary and funeral services, hospital maintenance, and waste removal workers.

Of the 20 bloodborne pathogens known to cause diseases such as malaria, syphilis, and hemorrhagic fever, there are three; hepatitis B (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) that are the most common pathogens of concern. These three

viruses account for the majority of occupationally-acquired infections and are associated with significant morbidity and mortality.[2][3] Although the vast majority of occupational exposures do not manifest in disease, the overall risk of the transmission is variably dependent on several factors, including the type and size of the inoculum, duration of exposure, a titer of the virus, and the prevalence of the active infection in the population.[1]

Hepatitis B is a viral infection capable of causing persistent, chronic infection that can lead to acute and chronic disease. It is a hepatotropic virus transmitted via blood or semen from infected individuals to those lacking immunity. HBV is a global health problem and a well-established occupational risk for health care workers. The incidence of HBV in the population is steadily rising, and the prevalence of HBV infection in health care workers is much greater than in the general population.[4] The virus is structurally stable, remaining viable and infectious for prolonged periods of up to 1 week on surfaces.[5] HBV is highly infectious and efficiently transmitted through percutaneous or mucosal exposure to infectious blood or body fluids. The risk of percutaneous HBV infection varies from 6 to 30%, depending on the serology of the source.[6][7] Vaccines to prevent HBV became available in 1981 and remained the mainstay of hepatitis B prevention. Among the safety measures listed, the Bloodborne Pathogens Standard mandates that employers ensure this vaccine's availability to all employees at risk for occupational exposure.[8][9]

Hepatitis C, another hepatotropic virus, is the most commonly reported bloodborne infection in the United States and a serious public health problem.[10] HCV is primarily transmitted via parenteral exposure, most commonly contaminated needles. The prevalence of HCV among health care workers does not exceed that of the general population; however, there is an increased risk of exposure in the health care setting. The risk of transmission when exposed to HCV-positive blood is 1.8%, considerably lower than HBV.[11][12][13] Treatments are evolving with the development of new, targeted therapies.[14] Currently, there is no vaccine or post-exposure prophylaxis (PEP) for HCV infection.

The human immunodeficiency virus (HIV) targets the immune system causing acquired immunodeficiency syndrome (AIDS). HIV is transmitted via direct contact with blood, semen, rectal fluids, vaginal fluids, or breast milk from an individual with a detectable viral load. In the workplace, occupational transmission is influenced by several factors, including volume of blood, type of procedure, type of injury, or percutaneous penetration. Compared to HBV and HCV, the percutaneous risk of HIV transmission is the smallest, estimated to be around 0.3%. [15][16] While there is no cure for the disease, there are antiviral medications that slow the progression. In cases of exposure, if taken within 72 hrs, administration of post-exposure prophylactic (PEP) medications are highly effective in preventing HIV.[17]

Collectively, bloodborne pathogens are a threat to human lives and remain a public health problem. It is estimated that approximately three million exposures to bloodborne pathogens occur annually.[17][18][19] In most work or laboratory settings, bloodborne infections are often due to accidental punctures. In the United States, there are an estimated 400,000 sharp injuries per year in the hospital setting.[20]

In 1991, the Occupational Safety and Health Administration (OSHA) issued the Bloodborne Pathogens Standard in response to the global concern. This standard ensures the safety of health care workers at risk for occupational exposure. The regulations prescribed to employers are located in Title 29 of the Code of Federal Regulations at 29 CFR 1910.1030. Strict adherence to these regulations and guidelines will reduce the risk, minimize exposure, and help prevent

bloodborne pathogens' transmission. Specifically, the federal standard mandates employers do the following:

- Establish and annually update an exposure control plan.
- Provide initial and annual education and training to workers.
- Make available hepatitis B vaccination series within 10 days of the employee's assignment.
- Implement the use of universal precautions.
- Identify and use approved engineering controls.
- Identify and ensure the use of work practice controls.
- Use of warning labels and/or signs to communicate hazards.
- Provide adequate and appropriate personal protective equipment (PPE) for employees.
- Establish readily available post-exposure evaluation and follow-up plans.
- Maintain employee medical and training records.

Since the highest proportion of bloodborne pathogens' occupational transmission was due to percutaneous injury, in 2000, the standard was revised to include the Needlestick Safety and Prevention Act (HR.5178). As the name suggests, this revision imposed additional requirements for employees with greater detail concerning their sharps protocol. Specifically, it requires employers to consider and implement new technologies and use effective and safer medical devices. When considering newer technologies, employers are required to solicit employee input. Lastly, employers are required to maintain a sharps injury log. Promotion of the use of safe needles or needleless devices, and other interventions, has resulted in a significant decline in percutaneous injuries among health care workers in U.S. hospitals.[21][20]

In addition to the federal standard, some states enacted additional laws to improve healthcare worker safety. These OSHA-approved and monitored state plans contain more stringent requirements than the federal standard and add unique provisions not included in the original standard. The state plans are more stringent than the federal standard, and at the very least, as effective in the protection and prevention of health care workers from occupational injuries, illnesses, and deaths. Each state law varies in terms of its time frame for development, coverage, and scope. Health care workers should consult their own state and local regulatory agencies to complete the provisions and regulations.

Exposure Control Plan

Prevention is the lynchpin of the Bloodborne Pathogens Standard and begins with developing an exposure control plan. Employers must develop and implement an exposure control plan that identifies and lists all job classifications and tasks for those who reasonably anticipate contact with blood or other potentially infectious materials as part of their duties. The plan must outline a schedule of standard implementation, review of engineering controls, and document annually consideration of safer medical devices specifically designed to reduce occupational exposures. Employers must seek and document input from non-managerial staff on the consideration, implementation, and effectiveness of newer engineering devices. The plan should also include employees trained to administer first aid to an injured employee if necessary.

Training

Training must be offered at no cost to each health care worker with the risk of occupational exposure before their first assignment and on an annual basis thereafter. Training elements include the following:

- General information about the epidemiology of bloodborne pathogens and the manifestation of disease
- Modes and risks of transmission of the bloodborne pathogens.
- Information on the Hepatitis B vaccine series.
- Explanation of the employer's exposure control plan
- Explanation of methods for recognizing high-risk exposure tasks Explanation of the use and limitations of methods to reduce exposure, including engineering controls, work practice controls, and the proper use and selection of PPE.
- Information on the removal, handling, decontamination, and disposal of PPE
- Incident reporting protocols.
- Post-exposure protocols including medical evaluation contact information and follow-up procedures.

Training materials must be readily available to workers, including access to a copy of OSHA's Bloodborne Pathogens Standard and information on how and where to access the exposure control plan. The training must be conducted by a knowledgeable person, delivered at an appropriate and understandable educational level and language. The trainer must provide sufficient time for an interactive question and answer session with the trainees.

Hepatitis B Vaccine

The Bloodborne Pathogens Standard mandates employers to make the hepatitis B vaccination series available to the worker, at no cost, within 10 days of the employee's assignment and after the required bloodborne pathogens training. The vaccination series, usually given as three or four shots over a six-month period, must be offered to the worker at a reasonable time and place. Employees have the right to decline the vaccination but must sign a declination form indicating such.

Universal Precautions

OSHA's bloodborne standard for reducing exposure risk and infection control is grounded on the adoption of Universal Precautions. Universal Precautions assumes that all body fluids (blood, saliva, secretions) and sites (open wounds and mucous membranes) contain pathogenic microorganisms, such as HBV, HCV, and HIV potentially infectious. Employees that observe Universal Precautions will treat all potentially infectious materials with appropriate precautions such as hand hygiene, the use of personal protective equipment (PPE), and engineering and work practice controls to limit exposure.

Engineering and Work Practice Controls

Engineering controls are devices and tools designed to isolate and remove contaminated equipment from the workplace. Work practice controls are alterations in how a workplace task is

completed to reduce the likelihood of exposure. When combined, these controls effectively eliminate or reduce the risk of exposure and transmission of infectious disease. Examples include handwashing facilities or antiseptic hand cleanser, proper use of personal protective equipment (PPE), needle safety devices, puncture-resistant, closeable, and leakproof sharp containers, and the proper handling, storage, and disposal of potentially hazardous materials.

PPE protects employees from exposure by creating a barrier against bloodborne pathogens. Employers must conduct a risk assessment of the worksite hazards, identify potential exposures and assign PPE accordingly. Basic PPE, including fitted gloves, masks, and gowns, should be readily available and worn whenever there is potential for contact with bodily fluids and contaminated equipment. PPE does not eliminate the hazard, and proper fit is critically important. For example, the surgical gown must provide adequate coverage in the critical primary protection zones. PPE that is too large or loose may minimize tactile sensitivity and has the potential to be a hazard. Properly fitted PPE has greater user satisfaction and is, therefore, more likely to be consistently worn.^[22] In addition to basic equipment, for procedures posing an additional exposure risk such as wound irrigation, additional protective equipment such as a face shield will provide a barrier to the back spray and should be readily available. Employers are responsible for the risk assessment, accessibility, proper use, cleaning, disposal, repair, and replacement of PPE.

Since the bloodborne pathogens standard was published, many different engineering controls and medical devices have been developed to reduce exposure risk. For example, contaminated PPE and equipment should be placed in appropriately labeled bags or containers for safe disposal. A warning label that includes the universal biohazard symbol must be displayed and readily observable on all bags and containers with contaminated items. The availability and use of engineering controls, including sharps disposal containers and self-sheathing needles, for removing contaminated pathogens is another important step in the safe removal of hazardous waste.

Along with PPE, proper hand hygiene is one of the most effective means of infection control and preventing disease transmission. All employees caring for patients must perform hand hygiene. Current CDC guidelines recommend using alcohol-based hand rub with at least 60% alcohol (60% ethanol or 70% isopropyl alcohol) or handwashing with soap and water for at least 20 seconds before and after touching a patient or performing an aseptic procedure. Hand hygiene should also be practiced when moving from a soiled to a clean body site, after touching a patient, contacting blood, body fluids, contaminated surfaces. Proper hand hygiene is necessary immediately before donning and immediately after doffing PPE.^[23]

Post-exposure Evaluation

Immediately after the exposure, the health care worker should be evaluated and first aid administered. First aid is site and injury-dependent. Wounds and skin injuries involving needle sticks or cuts in contact with blood or body fluids should be washed with soap water. Mucous membranes, such as the nose or mouth, should be flushed with water. If the exposure was to the eye, they should be irrigated with clean water, saline, or sterile irrigants.

Exposure to bloodborne pathogens should be promptly reported to the employer, such as the direct supervisor or department responsible for managing occupational health. Careful evaluation of the exposure and exposure source should be done. Medical evaluation of the employee must take place immediately because some treatment decisions, including chemoprophylaxis, must be made within 2 hours of exposure. Follow-up evaluations should occur at an occupational clinic in

one week, three months, six months, and twelve months depending on the exposure type and source. During these visits, the health care worker's health status is evaluated, and, depending on the infection, repeat testing may be necessary. A careful record of the specific circumstances and postexposure management plan must be included in the employee's confidential medical record.

Function

In the hospital setting, exposure to infectious blood and body fluids with subsequent risk of infection remains a major concern for health care workers. Health care workers in contact with blood, body fluids, or who perform invasive medical procedures are particularly at risk.[24]

Bloodborne pathogen transmission risk can be minimized or reduced by strict adherence to the OSHA Bloodborne Pathogens Standard. OSHA's Bloodborne Pathogens Standard applies to and protects workers who are at risk of exposure. Specifically, this standard is a regulatory guide that includes provisions for employers for post-exposure control, engineering and work practice controls, immunization schedules, and mandates for communication, employee training, and documentation. Both employers and health care workers should know the key elements and approaches to infection control to minimize the risks associated with exposure to bloodborne pathogens.

Issues of Concern

With the establishment of the bloodborne pathogens standard, exposure risks have decreased. Globally, however, bloodborne infections remain a major ongoing occupational threat. Between 1991 and 2015, there were over 77,00 citations issued and a striking level of noncompliance, mainly in exposure control plans and recordkeeping.[25] While the vast majority of occupational exposures do not result in infection, the life-threatening diseases carry a significant morbidity and mortality burden. Infected individuals may experience significant emotional distress such as anxiety, depression, and fear.[26][1] In addition to the health concerns, occupational exposure to bloodborne pathogens is costly, placing a significant economic burden on hospitals.[27][28]

Health care workers of all levels of training are at risk of occupational exposure to bloodborne pathogens. Regardless of the level of training, there is significant variability in knowledge, training, and practices which is an ongoing concern. This variability contributes to an overall sense of occupational insecurity and a general lack of personal safety confidence.

[29] Additionally, for reasons largely unknown, adherence to standard precautions and the most basic preventative method, hand hygiene, is unacceptable.[30][31][30]

Properly fitting PPE can reduce the risk of exposure, but there are many areas of uncertainty surrounding this area. For example, it is unclear which PPE combination provides optimal protection or the best way to don or doff PPE. It is also unknown what is the most effective training method to ensure the proper use of PPE.[22] Innovative methods such as active learning strategies and multimodal approaches have been reported, although the efficacy of these new training methods remains unclear.[32][33][34] Currently, no comprehensive standard exists specific to PPE use that considers the type of barrier protection, methods of donning or doffing, or training methods, and additional research is urgently needed.

Among the safety methods and training listed, the bloodborne pathogens standard mandates the HBV vaccine and vaccination series be made available to all workers who have a risk of occupational exposure. This mandate has resulted in an enhanced awareness of the risk, yet the vaccination rate is suboptimal.[8]

Along with suboptimal vaccination, training, and adherence, under-reporting and subsequent management of occupational exposure to bloodborne pathogens is a major concern.[35] As an example, in regions with high disease prevalence, the exposure rate is low.[36][37] Although most health care workers are cognizant of the risks associated with bloodborne pathogens, a high percentage fail to report exposure and do not seek appropriate medical evaluation. There are many reasons for this, including the lack of a reporting protocol or clear guidance. However, many times, it was the health care workers' perception that the exposure was low risk despite the unknown disease status of the involved patient.[36] While the true number of unreported incidents is not known, underreporting remains a major issue of concern. There is significant room for improvement in the attitudes, reporting behavior, and management practice of bloodborne pathogen exposure.

As evident with the COVID-19 pandemic, the epidemiology of existing and emerging infectious diseases is a dynamic process. With keen awareness, as information of the disease entity accumulates, the recommendations and guidelines may frequently change with intra- and international variance. Employers of healthcare workers face substantial challenges. In the face of outbreaks, employers, and the multidisciplinary team of occupational health clinicians and safety professionals, are tasked with writing, revising, and reinforcing exposure control plans adjusted to these dynamically changing situations unique to the setting.

Clinical Significance

The spread of infectious disease and health-care-associated infections is a major public health concern. In a healthcare setting, especially areas with exposure to blood and body fluids, the risk of transmission of HIV, HBV, and HCV are indisputable. These diseases are associated with significant morbidity and mortality. Therefore prompt reporting of exposure is essential. Timely medical evaluation and follow-up are equally critical, as prophylaxis or treatment measures for HIV, HBV, and HCV are highly effective when administered in the appropriate clinical timeframe. Occupational clinicians are an important part of the communication strategies and follow-up procedures designed to keep health care workers safe.

Other Issues

The global SARS-CoV-2 virus and COVID-19 pandemic, highly contagious virus, and public emergency underlined healthcare workers' occupational risks. In particular, the availability and severe shortage of basic PPE, including masks, gloves, and gowns, challenged the adherence to standards and the workers' personal well-being. International recommendations for PPE usage during the COVID-19 pandemic were variable, underscoring the need to develop and follow standards such as the Bloodborne Pathogens Standard to uniformly guide populations and those at risk.[29]

Occupational blood exposure is common and of great concern in resource-poor countries. [35] Several factors contribute to the large-scale transmission, including the higher prevalence of active infection in the population, limited vaccination coverage, and unsafe work practices. Despite recommendations and safety guidelines published by the World Health Organization, unsafe injection practices, especially needle and syringe reuse, remain common and an ongoing threat to patient and health care workers' safety. As with the transmission rate, the reason is probably multidimensional due to economic constraints (limited supplies), socio-cultural and political reasons. The true magnitude of the problem and burden of disease is not well

understood, and few effective prevention efforts have been initiated to protect the health care workers in these regions.

Enhancing Healthcare Team Outcomes

Bloodborne pathogens pose a significant risk to health care workers; consequently, employers are faced with many challenges related to controlling the frequency of exposures and transmission in a hospital setting. The cost of healthcare-associated diseases and percutaneous injuries is high, and the emotional burden on health care workers immeasurable. Administrative, behavioral, and engineering interventions have been mandated to reduce the frequency of exposure and prevent the transmission of bloodborne pathogens. Support is essential at every institution level to monitor compliance with mandated interventions, thus ensuring a safe workplace environment. The occupational health and safety professionals who are part of a multidisciplinary team consisting of physicians, nurses, safety professionals, and occupational health psychologists are pivotal in delivering essential overarching support to the institution's healthcare team.

Adequate and regular interprofessional training of all employees with a reasonable risk of occupational exposure is key to this process. While experts in their field of medicine, clinicians may not be as familiar with the current strategies related to the transmission and prevention of bloodborne pathogens and benefit from this type of training. Similarly, non-clinical employees who have no prior experience in handling hazardous materials or potentially infectious tissue or materials but are occupationally exposed will also benefit from this type of training. All participants must measure proficiency in handling potentially infectious materials and sharps before starting their assigned work activities. Training of the entire healthcare team will increase the overall awareness of occupational hazards, positively affecting healthcare team outcomes.

Even with a well-developed plan and comprehensive employee training, accidents will happen, and exposure to bloodborne pathogens will occur. Knowledge of post-exposure protocols is of critical importance to minimize harm to the employee. While not all exposures are preventable, the number of accidents has been significantly reduced by using safer medical devices, including needleless systems and sharps disposal containers.[20] [Level 4]

Both employers and the healthcare team have a shared responsibility to meet the patient's needs and minimize the exposure and transmission of infectious disease. As it affects so many people on the healthcare team, the outcomes of this multifactorial, comprehensive risk-reduction standard must be measured and followed. multifactorial. From a healthcare worker safety lens, improvement in outcomes requires workers to be comfortable recognizing risks, attentive participation to training, reporting incidents, and adapting to the challenging and potentially hazardous situations associated with working in a healthcare setting. From the safety lens of healthcare workers, the goal of outcome improvement necessitates that workers recognize risks, are active participants in their training, and are adaptable to the ever-changing situations faced as employees in a healthcare setting.

Review Questions

- [Access free multiple choice questions on this topic.](#)
- [Comment on this article.](#)

References

OSHA Bloodborne Pathogens Reading Questions (POS Task #404)

Student Name: _____ Date _____

Instructions

Read the assigned article: OSHA Bloodborne Pathogens Standard (NCBI StatPearls). Answer the following questions in complete sentences. Or visit <https://www.ncbi.nlm.nih.gov/books/NBK570561/>

Student Questions

1. What are bloodborne pathogens? Give one example.
2. List three major diseases caused by bloodborne pathogens discussed in the reading.
3. According to OSHA, what is the purpose of the Bloodborne Pathogens Standard?
4. Define Universal Precautions in your own words.
5. Name two engineering controls used to reduce exposure risk.
6. What types of personal protective equipment (PPE) may be required when exposure is possible?

7. What must an employer include in an Exposure Control Plan?
8. What should a healthcare worker do immediately after an exposure incident?
9. Why is proper sharps disposal important in preventing transmission?
10. What vaccination must employers offer to workers with occupational exposure?