OSHA estimates more than 5.6 million workers are at risk of occupational exposure to bloodborne pathogens. All occupational exposure to blood or other potentially infectious materials (OPIM) place workers at risk for infection with bloodborne pathogens. This course is designed for individuals who require bloodborne pathogens training, but are not required to develop or manage their exposure control plan (ECP).
OSHA Academy Course 655 Study Guide

Bloodborne Pathogens in the Workplace

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Contact OSHA Academy to arrange for use as a training document.

This study guide is designed to be reviewed off-line as a tool for preparation to successfully complete OSHA Academy Course 655.

Read each module, answer the quiz questions, and submit the quiz questions online through the course webpage. You can print the post-quiz response screen which will contain the correct answers to the questions.

The final exam will consist of questions developed from the course content and module quizzes.

We hope you enjoy the course and if you have any questions, feel free to email or call:

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Course Introduction

Why do I need to learn about the risk of occupational exposure to bloodborne pathogens?

OSHA estimates more than 5.6 million workers are at risk of occupational exposure to bloodborne pathogens. All occupational exposure to blood or other potentially infectious materials (OPIM) place workers at risk for infection with bloodborne pathogens.

Workers in many different occupations are at risk of exposure to bloodborne pathogens, including Hepatitis B, Hepatitis C, and HIV/AIDS. First aid team members, housekeeping personnel in some settings, nurses and other healthcare providers are examples of workers who may be at risk of exposure.

Employers are required to provide training to any employee that has a potential exposure to bloodborne pathogens. In addition, each employer must establish an Exposure Control Plan (ECP) for each worksite. We walk you through the process of setting up an ECP, and review all of the required components of the plan.
Module 1: What are Bloodborne Pathogens?

What are bloodborne pathogens?

Bloodborne pathogens are infectious materials in blood that can cause disease when transmitted from an infected individual to another individual through blood and certain body fluids.

Bloodborne pathogens are capable of causing serious illness and death. The most common illnesses caused by bloodborne pathogens are hepatitis B (HBV), hepatitis C (HCV), and acquired immunodeficiency syndrome (AIDS) resulting from human immunodeficiency virus (HIV).

1. As part of Kevin's job, he is required to provide emergency first aid to employees that become injured or ill while at work. What are the three primary bloodborne pathogens Kevin must be aware of due to occupational exposure?
   a. Influenza, Hepatitis A, Hepatitis B
   b. Hepatitis A, Hepatitis B, Hepatitis C
   c. Hepatitis B, Hepatitis C, Human Immunodeficiency Virus
   d. Hepatitis B, Hepatitis C, Measles

Who is covered by OSHA’s Bloodborne Pathogens standard?

The standard applies to all employees who have occupational exposure to blood or other potentially infectious materials (OPIM).

- Occupational exposure is defined as "reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or OPIM that may result from the performance of the employee's duties."

- Blood is defined as “human blood, human blood components, and products made from human blood.”

Other potentially infectious materials (OPIM) means:

a. The following 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 visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids;
b. Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and

c. HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

### 2. Who is covered by OSHA's Bloodborne Pathogens standard?

- a. Only private sector employees in healthcare settings
- b. Designated EMT's and nursing staff
- c. Employees who predisposed to infection at work
- d. Employees who have occupational exposure to blood or OPIM

### What is the purpose of OSHA’s Bloodborne Pathogens standard?

The purpose of the standard is to minimize or eliminate occupational exposure to disease-carrying microorganisms or "pathogens" that can be found in human blood and body fluids.

### Who must be trained under OSHA's Bloodborne Pathogens standard?

OSHA has mandated annual training is required for all employees with potential occupational exposure. This means if there is a reasonable possibility an employee might be exposed to blood or other potentially infectious bodily fluids, they must receive training to minimize or eliminate their risk to potential exposure.

### 3. What is the purpose of OSHA's Bloodborne Pathogens standard?

- a. To minimize exposure to disease-carrying pathogens found in human blood and body fluids
- b. To reduce the risk of exposure to all biological hazards in the workplace
- c. To inform employees of the risks associated with exposure to infectious pathogens
- d. To decrease the probability of infection from exposure to HIV

### What are the primary bloodborne pathogens?

The primary bloodborne pathogens are:

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

Other commonly recognized pathogens transmitted by body fluids include:

- West Nile Virus
- Malaria
- Syphilis

OSHA has determined employers can minimize or even eliminate occupational bloodborne hazards by developing and enforcing a combination of exposure control strategies which work for all bloodborne diseases. It is not enough for an employer to provide bloodborne pathogens training. They must also have a formal exposure control plan documented and implemented.

Training Is Not Enough; An Employer Must Implement A Formal Exposure Control Plan

4. As part of Allison's job, she is required to provide first aid treatment to those injured on the job. Which of the following bloodborne pathogens should she be aware of due to occupational exposure?
   a. Influenza
   b. Malaria
   c. Strep throat
   d. Allergies

Scenario

Stanley is an employee for a small manufacturing company. One of Stanley's job responsibilities is to respond to medical emergencies that might happen in the warehouse. Stanley has worked for his employer for five years and has never had to respond to an emergency.

Does Stanley still need to receive annual bloodborne pathogens training?

Yes!

The frequency in which an employee is exposed to potential bloodborne pathogens is not the standard used to determine the need for training. Because there is a reasonable possibility that Stanley might be exposed to bloodborne pathogens as an employee, he must receive
annual training. Neither Stanley nor his employer can predict when he might need to provide emergency medical care.
Module 2: Specific Bloodborne Pathogens

Hepatitis B Virus

The hepatitis B virus (HBV) is one of the primary causes of hepatitis, an infection which causes inflammation of the liver. Complications of hepatitis include cirrhosis (scarring) of the liver, liver cancer, and liver failure. There is no known cure for the hepatitis B virus. In the United States, approximately 15 to 25 percent of people infected with HBV will die because of the illness.

According to the hepatitis B Foundation, thousands of people in the United States and 600,000 people worldwide die from hepatitis B-related liver disease annually.

The Center for Disease Control (CDC) reported 2,953 confirmed acute cases of hepatitis B in 2014. The CDC estimates 19,200 people were infected with the hepatitis B virus the same year.

Hepatitis B can be either acute or chronic.

- Acute hepatitis B virus infection is a short-term illness that occurs within the first 6 months after someone is exposed to the hepatitis B virus. Acute infection can, but does not always, lead to chronic infection.

- Chronic hepatitis B virus infection is a long-term illness that occurs when the Hepatitis B virus remains in a person's body. Chronic Hepatitis B is a serious disease that can result in long-term health problems, and even death.

1. _____ Hepatitis B infection is a long-term illness that occurs when the Hepatitis B virus remains present in a person's body.
   - a. Symptomatic
   - b. Non-symptomatic
   - c. Chronic
   - d. Acute

Symptoms of HBV

Symptoms of HBV infection include, but are not limited to:

- loss of appetite
- fatigue
- fever
• nausea, vomiting and/or abdominal pain
• joint pain
• jaundice seen in the eyes

Jaundice, also called icterus, is a yellowing of the skin or eyes and occurs in the more serious phase of Hepatitis B virus. Hepatitis B can damage the liver, resulting in decreased liver function. As the liver’s ability to filter waste from the blood decreases, the concentration of waste in the blood increases. Only about 30 to 50 percent of individuals infected with hepatitis B virus show symptoms. It is important to understand even without symptoms, HBV-infected individuals are still infectious to others.

Click here to view the CDC fact sheet for Hepatitis B. (PDF)

2. Serious cases of Hepatitis B virus results in damage to the _____.
   a. Heart
   b. Liver
   c. Kidneys
   d. lungs

Exposure

An exposure that might place a worker at risk for HBV, HCV, or HIV infection is defined as:

   a. A percutaneous injury (e.g., a needlestick or cut with a sharp object); or

   b. Contact of mucous membrane or non-intact skin (e.g., exposed skin that is chapped, abraded, or afflicted with dermatitis) with blood, tissue, or other body fluids that are potentially infectious.

Indirect exposure from contaminated objects is a risk, because hepatitis B virus can remain infectious on environmental surfaces for up to a week (7 days) in the form of dried blood.

   This means you must always treat blood, wet or dry, as infectious!

Vaccination

A vaccination to prevent hepatitis B virus infection is available. The hepatitis B vaccine series is a sequence of three shots, typically given one month apart, that stimulate a person's natural immune system to protect against the virus. After the vaccine is given, the body makes
antibodies to protect a person against the virus. Antibodies are specialized proteins found in the blood that produce an immune response to a virus invading the body. These antibodies are stored in the body to guard against future infections. They will fight off an infection if a person is exposed to the hepatitis B virus in the future.

3. Serious cases of Hepatitis B virus results in damage to the _____.
   a. Heart
   b. Liver
   c. Kidneys
   d. Lungs

Hepatitis C Virus (HCV)

The hepatitis C virus (HCV) is also a significant cause of severe liver damage and death.

Hepatitis C kills more Americans than any other infection disease. Deaths associated with hepatitis C reached 18,153 in 2016, according to surveillance data released by the Centers for Disease Control and Prevention (CDC).

About 3.5 million Americans are currently living with hepatitis C and roughly half are unaware of their infection. Approximately 1 to 5% of people infected with hepatitis C virus die as a result of the long-term damage caused to the liver and body.

Approximately 70%-80% of people with acute hepatitis C do not have any symptoms. Some people, however, can have mild to severe symptoms soon after being infected, including:

- fever
- loss of appetite
- vomiting
- dark urine
- joint pain
- fatigue
- nausea
- abdominal pain
- clay-colored bowel movements
- jaundice (yellow color in the skin or eyes)

Click here to view the CDC fact sheet for Hepatitis C. (PDF)
4. Each of the following is a symptom of Hepatitis C EXCEPT _____.
   a. fever
   b. nausea
   c. joint pain
   d. dizziness

If symptoms do occur, the average incubation period is 45 days after exposure, but this can range from 14 to 180 days.

Many people infected with the hepatitis C virus do not develop symptoms.

Hepatitis C virus-infected individuals are infectious to other people, whether they show symptoms or not. Interestingly, the hepatitis C virus is strictly a human disease. It is not known to cause disease in any animals.

Blood testing for hepatitis C virus was not available until 1992. As a result, blood donation agencies did not screen for hepatitis C virus. Many hepatitis C virus infections occurred as a result of receiving blood products from infected individuals. Today, testing for hepatitis C is common place and should occur after any exposure to potential bloodborne pathogens has occurred.

There is no vaccine for hepatitis C.

Treatment

According to the CDC, approximately 15% to 25% of people infected with acute hepatitis C will naturally be able to clear the infection from their body without treatment.

There are several medications available to treat chronic Hepatitis C, including newer, more effective drugs with fewer side effects.

Around the World

According to the World Health Organization (WHO), 1.75 million people are infected with the hepatitis C virus each year. Approximately 71 million people are chronically infected and at risk of developing liver cirrhosis and/or liver cancer. About 400,000 people worldwide die from hepatitis C-related liver diseases each year.
Decontamination

Any blood spills - including dried blood, which can still be infectious - should be cleaned using a dilution of one-part household bleach to 10 parts water. Gloves should be worn when cleaning up blood spills.

5. Blood spills, including dried blood, containing HCV should be cleaned using a 10% dilution of household bleach, by mixing _____.
   a. 2 parts bleach with 8 parts water
   b. 1-part bleach with 9 parts water
   c. 4 cups bleach with 6 cups water
   d. 1 cup bleach with 10 cups water

Human Immunodeficiency Virus (HIV)

The Human Immunodeficiency Virus (HIV) is the virus responsible for causing Acquired Immunodeficiency Syndrome (AIDS). The HIV virus was originally identified on December 1st, 1981.

Statistics

- 38,500 new cases of HIV/AIDS in adults, adolescents, and children were diagnosed in 2015.

- As of 2015, approximately 1.1 million people are living with HIV. The CDC estimates 15% of people living with HIV do not know they are infected.

- As of December 31, 2013, 58 confirmed occupational transmissions of HIV and 150 possible transmissions had been reported in the United States.

- As of 2016, there are about 36.7 million people living with HIV around the world, with only 53% receiving treatment.

- In 2016, about one million people died from AIDS-related illnesses around the world.

The human immunodeficiency virus attacks and suppresses the immune system, reducing a person's ability to fight infection. The virus specifically targets the cells crucial for fighting infection from pathogens. This allows diseases and infections to progress without resistance.
Within a few weeks of being infected with HIV, some people develop flu-like symptoms that last for a week or two, but others have no symptoms at all. People living with HIV may appear and feel healthy for several years. However, even if they feel healthy, HIV is still affecting their bodies. Untreated early HIV infection is also associated with many diseases including cardiovascular disease, kidney disease, liver disease, and cancer.

6. How does infection with HIV reduce a person's ability to fight infection?
   a. HIV weakens the nervous system
   b. HIV suppresses key cardiovascular pathways
   c. HIV attacks and suppresses the immune system
   d. HIV fools cells to attack and destroy them

It can take many years before an HIV-infected person displays symptoms of the disease.

Symptoms include:

- enlarged lymph nodes
- fatigue
- frequent fevers
- persistent or frequent yeast infections of the mouth or vagina
- persistent or frequent skin rashes
- short-term memory loss
- weight loss
- enlarged liver and spleen

As with hepatitis B virus and hepatitis C virus, it is important to understand that individuals with HIV are potentially infectious to others, even though they may have no observable symptoms.

Presently, there is no known cure for HIV. Although the life expectancy for HIV-infected individuals has increased due to recent advances in treatment, the end result of HIV/AIDS is premature death.

HIV cannot reproduce outside the human body. It is not spread by:

- air or water
- insects, including mosquitoes: studies conducted by CDC researchers and others have shown no evidence of HIV transmission from insect
- saliva, tears, or sweat: there is no documented case of HIV being transmitted by spitting
- casual contact like shaking hands or sharing dishes
- closed-mouth or "social" kissing

All reported cases suggesting new or potentially unknown routes of transmission are thoroughly investigated by state and local health departments with assistance, guidance, and laboratory support from CDC.

**Disease Comparison**

Of the three major bloodborne pathogens, hepatitis B virus is the most contagious. Approximately 33% of individuals exposed to hepatitis B virus will become infected. Of those individuals exposed to hepatitis C virus, only about 2% will become infected.

Comparatively, human immunodeficiency virus is much less contagious than either form of hepatitis. About 0.33%, or 1 in 300, people exposed to HIV will become infected with the virus.

Despite these statistics, every exposure has the potential to transmit bloodborne pathogens and must be considered significant.

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7. Which of the three major bloodborne pathogens is the most contagious, with approximately 33% of those exposed becoming infected?

   a. Human Immunodeficiency Virus (HIV)
   b. Hepatitis B virus (HBV)
   c. Hepatitis C virus (HCV)
   d. Hepatitis A virus (HAV)
Scenario

Manuel is a nurse working nights in the local hospital. During a shift in the emergency department he is stuck with a used needle that punctures his skin and draws blood.

Is Manuel at risk for contracting hepatitis C?

Yes.

After a needlestick or sharps exposure to Hepatitis C-positive blood, the risk of infection is approximately 1.8%. Manuel should immediately report the potential exposure and follow his employer's exposure control plan to ensure he receives proper medical treatment and testing.

Scenario

Stacy is a police officer employed by the city of Denver, Colorado. She is regularly required to respond to emergency medical situations, often arriving before the local ambulance company. As a result, Stacy is frequently exposed to human blood.

Is Stacy likely to contract HIV from exposure to infected blood?

No.

If Stacy follows universal precautions she is not likely to contract HIV. Universal precautions involve the use of protective barriers such as gloves, gowns, aprons, masks, or protective eyewear, which can reduce the risk of exposure of the first aid provider's skin or mucous membranes to potentially infective materials.
Module 3: Transmitting Bloodborne Pathogens

Fluids that Spread Bloodborne Pathogens

The transmission of bloodborne pathogens from one person to another occurs through the transfer of infected body fluids.

Common body fluids which can transmit pathogens include:

- blood
- cerebral spinal fluid
- semen
- vaginal secretions

Semen and vaginal secretions can transmit bloodborne pathogens, but only during sexual contact.

Wearing disposable gloves can help protect you from accidental exposure to bloodborne pathogens.

1. How are bloodborne pathogens passed from one person to another?
   
   a. Through saliva
   b. Breathing
   c. Body fluids
   d. Shaking hands

Fluids that Do Not Spread Bloodborne Pathogens

Some body fluids have no documented risk of transmitting pathogens, including:

- sweat
- saliva
- urine
- feces
Although the risk of contracting a pathogen from these bodily fluids might be low, you may not always be able to tell which fluids you are handling, or whether an injury has mixed them with blood.

For example, a severe abdominal injury could cause blood to be present in urine or feces. Therefore, it is best to protect yourself from **ALL** bodily fluids.

### 2. How are bloodborne pathogens passed from one person to another?

- a. Through saliva
- b. Breathing
- c. Body fluids
- d. Shaking hands

#### How Bloodborne Pathogens are Transmitted

**Non-occupational** bloodborne pathogens are most commonly transmitted through:

- sexual contact; or
- sharing hypodermic needles.

**Occupational** bloodborne pathogens are most commonly transmitted through:

- puncture wounds from a sharp or contaminated object, such as broken glass; or
- from a splash of blood to the mucous membranes of the eyes, nose, or mouth.

### 3. How are *occupational* bloodborne pathogens most commonly transmitted?

- a. Sexual contact
- b. Puncture wounds from a sharp or contaminated object
- c. Sharing hypodermic needles
- d. Shaking hands

#### Protect Yourself from All Bodily Fluids

It's important to remember the hepatitis B virus can remain infectious outside of the body for up to 7 days. For this reason, it is essential that cleanup and decontamination of contaminated objects and surfaces be performed as soon as possible. This will reduce the risk of indirect contact resulting in a bloodborne exposure incident.
Understanding how bloodborne pathogens are transmitted will help reduce your risk of exposure and infection.

- **Casual social contact**, such as shaking hands, hugging, or sharing a telephone or tool, does not transmit bloodborne pathogens.
- **Direct contact** with blood or other potentially infectious bodily fluid can cause an exposure incident.
- **Indirect contact** with a contaminated object, such as a countertop, bedding, or clothing, can also cause an exposure incident.

4. **Cleanup and decontamination of contaminated objects and surfaces will reduce the risk of _____**.
   a. minor contact
   b. casual contact
   c. direct contact
   d. indirect contact

**Scenario**

Jasmine is a daycare worker taking care of children between the ages of 6 months and 12 years. Kevin is a 3-year-old child at the daycare center and has been complaining of a stomachache. Suddenly Kevin begins to vomit unexpectedly. After Kevin's parents have been called to pick him up, Jasmine is asked to clean up the mess.

**Should Jasmine be concerned about bloodborne pathogens?**

**Yes!**

Although vomit is not documented as a risk for transmitting bloodborne pathogens, it is often impossible to determine if there is blood mixed in with the vomit. Even a very small amount of blood has the potential to transmit disease. You should always prevent contact with bodily fluids, regardless of whether blood is visible in the fluids.
Module 4: The Exposure Control Plan

The Exposure Control Plan

An employer exposure control plan (ECP) is a requirement of 29 CFR 1910.1030(c) of the Bloodborne Pathogens Standard established by the Occupational Safety and Health Administration (OSHA). The purpose of the ECP is to establish procedures to eliminate or minimize employee exposure to bloodborne pathogens.

Does your employer have an exposure control plan?

A written ECP outlines the strategies necessary to eliminate or minimize employee occupational exposure to bloodborne pathogens. This site-specific plan identifies all employee classifications which have occupational exposure to bloodborne pathogens and other potentially infectious materials.

Additional components of an ECP are:

- Engineering and work practice controls
- Personal protective equipment (PPE)
- Housekeeping
- Containment and labeling of potentially infectious materials

Another key component of the plan includes listing the site-specific means by which the facility will reduce the employee risk. These methods include appropriate training, the communication of hazards, hepatitis B vaccinations for any employee who has occupational risk of exposure, methods for post-exposure evaluation and follow-up, proper recordkeeping, and a sharps injury log.

1. What is the main purpose of an exposure control plan?
   a. Keep employees fully trained
   b. Comply with OSHA
   c. Establish procedures to minimize or eliminate exposure to bloodborne pathogens
   d. Recordkeeping purposes
Your employer's exposure control plan (continued)

The plan should also describe the procedure for investigating and evaluating the circumstances surrounding an exposure incident to quickly provide effective follow-up care to exposed employees. The investigation will also help each site team learn from accidents and establish new measures to prevent them from happening again.

The written ECP must be accessible to all employees. It must be reviewed and updated annually or when alterations in procedures create the possibility of new occupational exposures. Additionally, non-managerial employees who provide direct patient care must be asked to provide input in the identification, evaluation, and selection of effective controls to isolate or remove bloodborne pathogens from the workplace.

Although an employee's job description may include information regarding potential exposure to bloodborne pathogens, it may not be legally required. The employer's exposure control plan must identify all specific procedures an employee performs which may expose them to bloodborne pathogens.

Employees Must Have Access To Their Employer's Exposure Control Plan (ECP)

2. How often should the employer ECP be reviewed?
   
   a. Weekly
   b. Annually
   c. Monthly
   d. Daily

Scenario

Steven is a new employee for AAA Manufacturing. He has been hired as a supervisor to oversee line production on the swing-shift. As a supervisor, he is expected to provide emergency medical care if an employee becomes injured or sick.

Should Steven's position be classified as having occupational exposure to bloodborne pathogens?

Yes!

Although providing emergency medical care is not Steven's primary responsibility, it is part of his job classification. As a result, Steven does have the potential for occupational exposure to
bloodborne pathogens. Steven's employer must ensure he has the proper training and equipment to provide medical care safely and with minimal risk of occupational exposure.
Module 5: Recognize the Potential for Exposure

Employer Responsibilities to Identify Jobs at Risk

Employers must identify job classifications in which employees have occupational exposure, as well as the associated tasks and procedures in which there is a potential of exposure to blood or other infectious materials. Employers must review job classifications annually to ensure proper procedures and training is established.

1. How often should an employer review job classifications?
   a. Weekly
   b. Daily
   c. Annually
   d. Monthly

What jobs are most at risk of exposure?

Occupations with a likely chance of occupational exposure include:

- first aid providers
- daycare workers
- lab workers
- Emergency Medical Technicians (EMTs) and paramedics
- medical and dental personnel
- teachers
- housekeepers
- firefighters
- law enforcement agents

An employer must review every job classification and make a determination of the potential occupational exposure for that position. Failure to properly identify potential occupational exposure can result in warnings or fines issued by OSHA.

If an occupational exposure does occur, it is important for you to follow the employer's written procedures for handling medical self-care and evaluation, as well as documenting the circumstances of the exposure.
2. What could happen to a company that doesn't properly identify potential occupational exposures to bloodborne pathogens?

   a. Business may be shut down
   b. OSHA warning or fine
   c. Management fired
   d. Employees fired

Scenario

Maria is an employee for a local hospital and works in their housekeeping department.

Is it Maria's responsibility to know what her occupational exposure is?

No.

It is the employer's responsibility to ensure each employee is properly trained and understands their potential occupational exposure. Further, the employer is responsible for documenting the training and maintaining all associated records. Maria has the responsibility to follow the established procedures identified in her employer's exposure control plan and ask questions if needed.

It is important to know if your job classification puts you at risk for occupational exposure. If your job classification does put you at risk, be aware that specific tasks or procedures in your job may still have the potential for exposure.
Module 6: Exposure Control Methods

Methods To Control The Risk Of Exposure

The recommended infection-control concept called "Universal Precautions" advocates everyone's blood and body fluids be considered potentially infectious. This eliminates the difficulty in determining risk individually. Remember, although some bodily fluids have not been documented to transmit pathogens, it is sometimes impossible to tell if blood or another potentially infectious fluid is present.

1. What is the basic assumption of "Universal Precautions?"

   a. Only engineering controls can eliminate exposure to all infectious materials
   b. Everyone should be considered infected with bacterial or viral pathogens
   c. Everyone's blood and body fluids are considered infectious
   d. It is universally accepted that blood as contagious

The two essential control strategies employees use to eliminate or minimize the transmission of bloodborne diseases in the workplace are:

- engineering controls, and
- work practice controls.

Engineering Controls

Engineering controls minimize exposure in the workplace either by removing or isolating the hazard, such as providing a sharps container for needles, splash guards, and mechanical pipetting devices.

Engineering controls are all about the **equipment** used to minimize exposure.

- The Sharps container for needles is a good example of an engineering control.
- Employers will examine and maintain or replace engineering controls on a regularly scheduled basis.
2. Engineering controls are all about the _____ used to minimize exposure.
   a. employee practices
   b. design of equipment
   c. techniques
   d. personal protective equipment

Work Practice Controls

Work practice controls focus on the way tasks are performed. For example, using disposable gloves when performing emergency care is considered a work practice control. Another example of work practice controls is to perform all actions involving potentially infectious material in such a way as to minimize splattering, splashing, and spraying. Proper handling and disposal of needles or sharps, contaminated bandages, gauze, or linens is also essential.

Work practice controls are all about how tasks are performed to minimize exposure.

Safe work practices include eliminating eating, drinking, smoking, applying make-up or lip balm, or handling contact lenses in locations with potentially infectious material. In healthcare facilities, employees are prohibited from wearing artificial nails. Food and drink must not be kept in a refrigerator, freezer, shelf, or in the general area of where blood or other potentially infectious material are kept.

3. Work practice controls are all about _____ to minimize exposure.
   a. how tasks are performed
   b. how equipment is designed
   c. the use of personal protective equipment
   d. written safety policies

Wash your hands!

Hand washing after an exposure can reduce your risk of infection.

Your employer must provide readily accessible hand-washing facilities or antiseptic hand cleanser or wipes if hand-washing facilities are not available.

Perform hand washing immediately after any exposure, even if you were wearing gloves. Vigorous scrubbing with soap or alcohol-based foam or gel and warm water is considered the
most effective technique. This will further reduce your risk of infection resulting from an exposure.

**Prohibited Practices**

Practices that are completely prohibited in the workplace include: bending, recapping, and removing contaminated needles, shearing or breaking needles, and mouth pipetting or suctioning of potentially infectious material.

These practices significantly increase the risk of exposure. As a result, they should never be performed by employees.

4. **What can greatly reduce the risk of infection after exposure to bloodborne pathogens?**
   - Wiping down surfaces
   - Latex gloves
   - Recapping used needles
   - Hand washing

**Alternatives**

Antiseptic hand cleaner in conjunction with clean cloth/paper towels or antiseptic towelettes are examples of acceptable alternatives to running water.

However, when these types of alternatives are used, employees must wash their hands (or other affected areas) with soap and running water as soon as feasible.

This alternative would only be acceptable at worksites where soap and running water are not feasible.

5. **What is important to remember if you have used antiseptic hand cleaner to clean your hands?**
   - Be sure to wipe your hands with a paper towel
   - Do not eat food for at least 15 minutes
   - Rinse with plain water
   - Use soap and water as soon as possible
Scenario

Dr. Kramer owns and operates a small dental clinic in San Francisco, CA. As part of her exposure control plan, she requires her employees to wash their hands before and after working with any patients. She also requires new gloves be used with every patient.

Is this an example of engineering controls or work practice controls?

Work practice controls

Dr. Kramer is requiring her employees to do something to reduce the risk of occupational exposure. Work practice controls focus on the actions taken to minimize exposure.
Module 7: Personal Protective Equipment

Using Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) is specialized clothing or equipment that protects you from exposure to blood or other potentially infectious material.

Personal protective equipment is designed to keep blood and other potentially infectious material away from your skin, eyes, and mouth.

Examples of PPE include: disposable gloves, gowns, laboratory coats, protective face shields, resuscitation masks or shields, and mouth pieces. Any equipment necessary to prevent exposure to blood or other potentially infectious material is considered PPE.

1. How does PPE protect you from exposure with blood and other potentially infectious materials (OPIM)?
   a. Eliminates the source of exposure
   b. Absorbs the infectious material
   c. Keeps infectious away from skin, eyes, and mouth
   d. Protects by increasing distance

Effective PPE

Effective personal protective equipment must not allow potentially infectious materials to pass through or reach your skin, eyes, mouth, or clothes under normal conditions of use.

The following items that are not intended to function as a protective barrier against hazards are not considered to be PPE:

- general work clothes
- uniforms
- pants
- shirts, or blouses
2. Which of the following is NOT an acceptable form of PPE?
   a. Laboratory coats
   b. Uniforms
   c. Face shields
   d. Face masks

Employer Responsibilities

An employer must ensure employees use appropriate personal protective equipment.

Your employer must make PPE available to you in the appropriate size and at no cost. Non-latex alternatives will also be made available to employees who have allergic sensitivity to latex. Employers must also properly clean, launder, repair, replace, or dispose of contaminated PPE as needed at no cost to the employee.

*Employees should never take contaminated clothing home to be washed.*

3. When should employees take home contaminated clothing to be washed?
   a. Never
   b. Daily
   c. If exposure occurs
   d. As needed

Disposable Gloves

Disposable gloves should be a standard component of emergency response and first aid equipment and should be worn by anyone initiating emergency care.

It is best to always wear disposable gloves when providing first aid care.

Replace your gloves as soon as possible if they are torn, punctured, contaminated, or if their ability to function as a barrier is compromised.

Contaminated Protective Equipment

Remove contaminated gloves by turning them inside out. Be careful to prevent any splashing or spraying of potentially infectious material. You should always wash your hands after removing your gloves, even if you don't think they were contaminated.
4. Remove contaminated gloves by _____.
   a. cutting them off with scissors
   b. pulling them off fingers first
   c. turning them inside out
   d. having a coworker remove them

Face Shields

Wear face shields when splashes, sprays, spatters, or droplets of infectious material pose a hazard to your eyes, nose, or mouth. It is always better to be prepared and wear a face shield if there is any chance of potential exposure to your eyes, nose, or mouth.

Pocket CPR Mask and Gloves

Use a disposable ventilation mask or shield with a one-way valve to prevent an exposure when performing rescue ventilations during CPR. It is common for patients to vomit during CPR due to excess air in the stomach.

Contaminated Protective Equipment

Place contaminated protective equipment in appropriately designed areas or containers for cleaning or disposal. These areas or containers should be properly labeled and identified in your employer’s exposure control plan.

5. When performing CPR, it is best to do each of the following EXCEPT _____.
   a. wearing disposable gloves
   b. using two-way valves
   c. being prepared for patient to vomit
   d. using a mask or shield

Scenario

Sarah is a medical laboratory technician. As part of her job duties she analyzes blood and body fluid samples. Sarah was recently reprimanded for not wearing disposable gloves to perform her work duties. She tells her supervisor the gloves make it hard for her to handle the collection containers and that she would prefer to not wear gloves.

What should Sarah’s supervisor tell her?
Sarah's supervisor must tell her the use of personal protective equipment is not optional. She must wear the gloves. The supervisor should also ask Sarah if the gloves are the correct size and fit for her hands. If the gloves are not the correct size, then this issue must be resolved as well. Only under very rare circumstances can an employee decline the use of personal protective equipment.
Module 8: Hepatitis B (HBV) Immunization

Getting vaccinated

The best way to prevent Hepatitis B is by getting vaccinated.

The Hepatitis B vaccine is considered one of the safest and most effective vaccines ever made. Numerous studies looking at the vaccine's safety have been conducted by the Centers for Disease Control and World Health Organization.

Your employer must offer you a hepatitis B vaccination series if you have a risk of occupational exposure to blood or other potentially infectious materials. Your employer must pay for the cost of the vaccination series. You must be offered the vaccination before you undertake tasks that expose you to potentially infectious materials, and at a reasonable time and location.

1. When should your employer offer the vaccination for HBV?
   a. Within one week of hire and assignment
   b. After you are exposed to bloodborne pathogens
   c. If you may be exposed to human blood or OPIM
   d. After you are exposed to OPIM

Three shots!

The Hepatitis B immunization series requires three separate injections.

The Hepatitis B vaccine is very effective in protecting against the hepatitis B virus. Approximately 90 percent of people who receive the vaccine will become fully immune to the virus. It is given in a series of three shots. The entire series of shots is required to provide full immunity. The vaccine is safe with very few adverse reactions.

Typical Vaccination Schedule

The first injection can be administered at any given time. The second injection must be given at least one month after the first, and the third injection must be given six months after the first.
2. The second injection for the HBV vaccination should be given at least _____ after the first.

   a. 3 weeks  
   b. 1 month  
   c. 2 weeks  
   d. 1 week

If You Decline the Vaccination

A licensed physician or other healthcare professional will perform or supervise the vaccinations.

Your employer does not have to offer you the vaccination series if you have previously received the complete series or have tested as immune to HBV.

You can decline the vaccination for hepatitis B after being informed of the risks and benefits. To do this, you must sign a declination form. If you initially decline the vaccination for hepatitis B, you can later request it from your employer at no charge.

There are currently two vaccines used to prevent Hepatitis B infection in the United States. Neither vaccine contains blood products. You cannot get Hepatitis B from these vaccines.

3. If you wish to decline the vaccination for Hepatitis B, you must _____.

   a. sign a declination form  
   b. quit the job  
   c. tell your supervisor  
   d. don't attend the scheduled appointment
**Scenario**

Tony has just been accepted to a local paramedic training program. Before beginning the program, the school requires students to receive the Hepatitis B vaccination and pay for it themselves.

**Is the school required to pay for the vaccination?**

**No.**

Typically, only employers are required to pay for the Hepatitis B vaccination series. Post-secondary schools can require the vaccination series as an admissions requirement and require the applicant to pay for the cost. There have been instances where public school districts (K-12) have been required to pay for the vaccination series if there is a potential for the student to be exposed to bloodborne pathogens as part of their coursework.
Module 9: When an Exposure Occurs

What to do When You are Exposed

When an exposure occurs, immediate self-care is the highest priority. Flush potentially contaminated materials from the mucous membranes of the eyes, nose, and mouth with large amounts of running water.

Allow a puncture wound from a potentially contaminated sharp object to bleed. Wash the wound with soap and water.

Wash potentially contaminated material off your skin with soap and water as quickly as possible after an exposure. Washing is especially important when you have cuts, rashes, or scrapes on your skin.

When available, use a face and eye wash station to flush the eyes, nose, or mouth if they are exposed to blood or bodily fluids.

1. While providing first aid treatment to a fellow employee, Maria had blood sprayed into her eyes. What should Maria do first?
   a. Report the incident to her supervisor
   b. Continue working until her next scheduled break
   c. Provide immediate self-care
   d. Go to the hospital

What do you do next?

After self-care, report the exposure incident without delay. This allows for timely testing of the source individual and, if necessary, the employee.

You will be directed to a healthcare professional for medical evaluation as soon as possible after receiving the source individual's test results. The evaluation will document the route of exposure and how the exposure occurred. There is no cost to you for this evaluation.
2. What action should you take after completing self-care following exposure to bloodborne pathogens?
   a. Continue working
   b. Report the incident
   c. Call a doctor
   d. Take the rest of the day off

Post-Exposure Therapy

If you are exposed to HIV-infected blood, most medical facilities offer short-term therapy called Post-Exposure Prophylaxis (PEP). This involves taking HIV medicines soon after a possible exposure to HIV to prevent becoming infected with HIV. This therapy must begin as soon as possible after the exposure. PEP can reduce the risk of getting HIV by as much as 80 percent.

The evaluation will also include counseling and education regarding the testing process and the ramifications of the exposure. This includes sexual practices information for the six-month post-exposure evaluation period.

The result of testing is confidential and will be reported only to you and will be placed on your company’s exposure control plan. No other person will be notified of the results.

3. What should you do to reduce the risk of getting HIV after exposure?
   a. Begin Post-Exposure Prophylaxis
   b. Investigate alternative treatments
   c. Get blood tests every three months
   d. See the doctor if symptoms surface

Scenario

Patrick is a nurse working in the emergency department of the local hospital. During one of his shifts he is accidentally jabbed by a used needle. The needle punctures his skin and draws blood.

What should Patrick do?

Immediate self-care is Patrick’s first priority.
He needs to allow the puncture wound to bleed, hopefully flushing any contaminants out of his body. Next, he should wash the affected area thoroughly with soap and water.

Next, Patrick needs to report the incident to his direct supervisor so an injury report can be completed. Patrick will then be seen by a health care professional to determine the best course of treatment for him. Sometimes it is possible to test for various diseases if the exposure source can be identified. This is not always possible.
Module 10: Housekeeping

What is housekeeping?

"Housekeeping" refers to ensuring a worksite is maintained in a clean and sanitary condition.

An employer must implement an appropriate written schedule for cleaning and determine the best method to decontaminate each location within a facility.

There are four types of regulated waste that require special handling:

1. Liquid or semi-liquid blood or potentially infectious materials
2. Contaminated items that could release potentially infectious material in a liquid or semi-liquid state
3. Items caked (solid or dry) with potentially infectious materials that are capable of releasing these materials during handling
4. Contaminated sharp objects

1. Each of the following is a type of regulated waste EXCEPT _____.
   a. Liquid/semi-liquid blood or OPIM
   b. Contaminated items that could release infection liquid/semi-liquid
   c. Cleaning liquids and equipment
   d. Contaminated sharp objects

Potentially Biohazardous Waste

It is of the utmost importance that infectious waste be safely contained.

- Infectious waste should be placed in specially designed containers constructed to contain the contents.
- The containers need to be leak-proof, labeled or color coded, and closed prior to removal to prevent spills.
- If a container is leaking, place it in a secondary leak-proof container.
2. Infectious waste containers need to be ________.
   a. disposed of in dumpsters in a timely manner
   b. leak-proof, labeled or color-coded
   c. designed to reduce over-pressure buildup
   d. labeled in both English and the native language

Contaminated Laundry

"Contaminated laundry" refers to laundry that is soiled with potential infectious material or that may contain sharp objects, such as needles.

When working with contaminated laundry, the following guidelines should be followed:

- Contaminated laundry should be handled as little as possible.
- Wear gloves when handling contaminated laundry, and place it in labeled, leak-proof bags or containers before transporting it.
- Never take contaminated protective clothing home for laundering, even if it is personal clothing.
- Pick up potentially contaminated broken glassware using mechanical means only, such as tongs, forceps, or brush and dustpan.
- Never use your hands, even if you are wearing gloves.

3. Which of the following is TRUE when picking up the contaminated glass?
   a. Use mechanical means only
   b. Use the thumb/forefinger technique
   c. Use only leather gloves
   d. Use hand to place the glass into a sack

Contaminated items should not be stored or processed in a way that requires you to reach into containers.

Work practice controls should be established to prevent you from reaching into a container to remove potentially contaminated items, such as glassware or needles.
All equipment and work surfaces that could become contaminated should be cleaned and decontaminated routinely using an appropriate disinfectant while wearing PPE.

All pails, bins, and similar reusable receptacles should be decontaminated on a regular basis and as soon as possible after visible contamination is noticed.

4. Which of the following strategies should be used to prevent employees from reaching into contaminated containers?

   a. Common sense
   b. Safety policies and rules
   c. Administrative guidelines
   d. Engineering and work practice controls

Scenario

Kevin is a custodial engineer for a local middle school. As part of his job duties, he is required to clean the health room daily. It is common for students to have minor injuries or ailments, such as nose bleeds or a skinned knee, during the school day.

What housekeeping issues does Kevin face?

It is important all contaminated materials, such as bloody gauze, is contained, labeled, and disposed of properly. Kevin should wear PPE, such as gloves, when performing this task. Kevin should decontaminate the health room surfaces daily using an approved method and appropriate disinfectant. If visible blood or body fluids are present on a surface, the fluid should be cleaned, and the surface decontaminated immediately.
Module 11: Communicating a Hazard in the Workplace

Primary methods of communicating: Signs and Labels

Signs and labels that alert you to the presence of potentially infectious material and the risk of exposure are vital to a workplace with occupational exposure to potentially infectious materials.

Be sure you are aware of and abide by all signs and labels signaling hazards and hazardous material.

Signs should have a fluorescent orange or orange-red background with a black "biohazard" symbol in the foreground.

Labels must contain the biohazard symbol and must have the word "Biohazard" written on them.

A biohazard label or sign should be attached to each object or container of contaminated material by string, wire, adhesive, or another method that prevents loss or unintentional removal of the label or sign.

When red bags or containers with the biohazard symbol on them are used, a sign or label is not necessary.

Also, when medical laboratory personnel are drawing and testing blood samples, the individual containers housing potentially infectious materials do not need to be labeled.

Properly indicating contaminated material using labels and signs will greatly reduce the risk of accidental exposure to the contaminated material. It is important to maintain appropriate container labeling at all times.

Annual training must be conducted for all employees with occupational exposure.

1. Signs used to warn of potentially infectious materials should have a _______.
   
   a. fluorescent yellow background with a black "lightning bolt" symbol in the foreground
   b. fluorescent red background with a black "radioactivity" symbol in the foreground
   c. fluorescent orange or orange-red background with a black "biohazard" symbol in the foreground
   d. red background with a black "skull" symbol in the foreground
Information and Training

All employees (including part-time and temporary employees) with occupational exposure in the organization should participate in a training program that is provided at no cost during working hours. The training materials used should be appropriate in content and vocabulary to the educational and literacy levels and are conveyed in the language of the employees.

The training materials should clearly state the objectives of the training. Trainers should be knowledgeable in the subject matter covered by the training program as it relates to the workplace. All employees should have an opportunity for interactive questions and answers with the person(s) conducting the training. If computer or online training is used, it should provide an opportunity for a person knowledgeable about the training material to be available to answer questions.

2. Each of the following is a requirement of bloodborne pathogens training EXCEPT _____.

   a. it must be conducted during normal work hours
   b. it must require an 80% passing score on exams
   c. it must be paid for by the employer
   d. it must be conveyed in the language of employees

Training Program Elements

The Bloodborne Pathogens training program should include information and explanations of at least the following:

- epidemiology, symptoms, and modes of transmission of bloodborne diseases
- the exposure control plan that has been implemented and how to obtain a copy of the written plan
- appropriate methods for recognizing tasks and activities that may involve exposure to blood or OPIM
- use and limitations of methods that will prevent or reduce exposures, including appropriate engineering, administrative or work practice controls, and personal protective equipment (PPE)
- the basis for selection of PPE
• types, proper use, location, removal, handling, decontamination, and disposal of PPE
• hepatitis B vaccination series, including its efficacy, safety, method of administration, benefits, and the fact that the vaccination will be offered to employees free of charge
• appropriate actions to take and persons to contact in an emergency involving blood or OPIM
• procedure to follow if an exposure incident occurs, including the:
  o method of reporting the incident
  o medical follow-up that will be made available
  o procedure for recording the incident in the sharps injury log
  o post-exposure evaluation and follow-up that will be made available to employees
• signs, labels, and/or color codings used

3. Signs used to warn of potentially infectious materials should have a ________.
   a. fluorescent yellow background with a black "lightning bolt" symbol in the foreground
   b. fluorescent red background with a black "radioactivity" symbol in the foreground
   c. fluorescent orange or orange-red background with a black "biohazard" symbol in the foreground
   d. red background with a black "skull" symbol in the foreground

**Frequency of Training**

Training should be provided at the time of employees' initial assignment (to tasks in which occupational exposure may occur) and at least annually thereafter (i.e., within one year of their previous training).

Additional training, limited to addressing the new exposures created, is provided to the employee whose occupational exposure is affected by:

• introduction of new engineering, administrative, or work practice controls
• changes or modifications in existing tasks or procedures
• institution of new tasks or procedures

4. Training should be provided at the time of an employee's initial assignment in which occupational exposure may occur, and at least _______.
   a. semi-annually thereafter
   b. annually thereafter
   c. every 2 years thereafter
   d. every 3 years thereafter

Scenario

Jennifer works for a computer parts manufacturer. One of her job duties is to perform housekeeping tasks for her section of the warehouse. During her last shift an employee was injured and required first aid treatment, producing contaminated clothing and personal protective equipment. This contaminated material needs to be labeled and disposed of.

How should Jennifer dispose of this contaminated material?

Jennifer needs to use appropriate personal protective equipment while working with the contaminated materials.

She must also place the contaminated material in a leak-proof bag that is labeled with the symbol and word "Biohazard".

Jennifer should then dispose of the bag based on her employer's exposure control plan.
Citations


