

Bloodborne Pathogens Training



“This training was prepared by the Dept. of Labor & Industries with modifications and additions we added to apply to our specific workplace situation.”

(Photo from WISHA Archives)

Course Objectives



- What are Bloodborne Pathogens (BBPs)?
- Why are they harmful?
- How can I protect myself?
- What is an Exposure Control Plan?

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“In this training program, you are going to learn about what bloodborne pathogens are; some of the important/serious diseases they cause and their symptoms; how they are transmitted, or spread; what you can do to prevent contracting these diseases; and what our Exposure Control Plan is here at *(fill in your company name)*.”

“Before we begin discussing bloodborne pathogens, I am going to start with a general overview of microorganisms and how they cause diseases.”

General overview

PATHOGEN: a microorganism that can cause disease

Examples of Illnesses Pathogens Cause

- | | |
|--------------------|---|
| • Viruses | AIDS, Hepatitis B, colds, flu, Herpes |
| • Bacteria | Intestinal diseases, Tuberculosis, Gonorrhea |
| • Fungi | Athlete's foot, Farmer's lung, Asthma/allergies |
| • Parasites | Giardiasis, Malaria, Trichinosis |

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E. coli (bacteria)



Trichinella (parasite)

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"Microorganisms that cause diseases are generally referred to as pathogens. They are generally classified into four main groups:

- "Viruses: Are extremely small infectious agents that are basically packages of genetic material. They can reproduce only within cells of living hosts by taking over and forcing the host cells to reproduce the virus. Some examples of illnesses they cause include AIDS (caused by HIV); Hepatitis B; a variety of colds and flus; and Herpes.
- "Bacteria: Are one-celled living organisms that do not require a living host cell to reproduce. E.coli and salmonella are a couple of examples that cause intestinal diseases; tuberculosis and gonorrhea are other examples.
- "Fungi: Fungi include yeasts and molds. They are single or multi-celled plants that live by decomposing and absorbing the organic material in which they grow. They can cause diseases such as athlete's foot, ring worm, and farmer's lung, and also cause asthma and allergies.
- "Parasites: Are single or multi-celled plants or animals that live upon, or within, other living organisms (hosts) from which they obtain some advantage, like nutrients. Some examples include giardia (beaver fever); malaria; and trichinosis. Trichinosis is caused by eating raw or undercooked pork and wild game products infected with the larvae of the *Trichinella* worm."

Note: This slide is animated

Transmission of Diseases



Organisms can enter the body via

- **Inhalation**

Air



- **Ingestion**

Contaminated food, water



- **Contact**

Bloodborne



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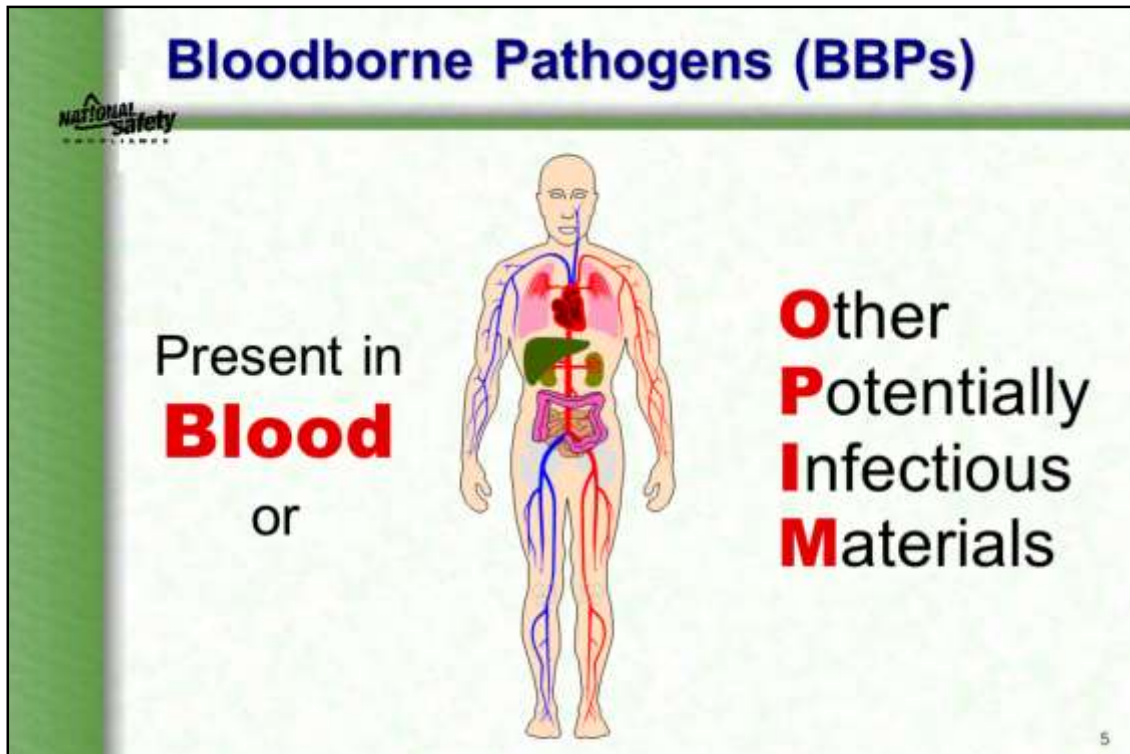
“Routes of Transmission: The first step in preventing disease is to keep the organism from entering the body. There are three primary routes of entry:

- “Inhalation: a pathogen is usually carried on respiratory droplets in the air and enters the respiratory system; for example, colds, flu, and tuberculosis are transmitted when an infected person coughs or sneezes and spreads the microorganism through the air to others.

- “Ingestion: the pathogen is ingested, usually via contaminated hand or food. For example, in food-borne outbreaks of Hepatitis A, the virus is shed in the feces of an infected restaurant worker who doesn’t wash his/her hands properly after going to the bathroom, and then spreads the virus by handling or preparing uncooked foods or foods after cooking.

- “Bloodborne contact: This is the focus of today’s training. In the following slides, I will explain how bloodborne diseases are transmitted, which diseases are of primary concern, their incidence and prevalence, and the symptoms of these diseases.”

NOTE: this slide is animated



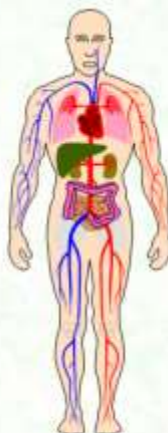
“Bloodborne Pathogens are microorganisms that are present in blood or other potentially infectious materials (OPIM) and can cause disease.

“‘Blood’ includes human blood, human blood components, products made from human blood, and also medications derived from blood (e.g., immune globulins, albumin, etc.).”

Bloodborne Pathogens (BBPs)

OPIM

- semen
- vaginal secretions
- body fluids such as pleural, cerebrospinal, pericardial, peritoneal, synovial, and amniotic
- saliva in dental procedures (if blood is present)
- any body fluids visibly contaminated with blood
- body fluid where it is difficult to differentiate



- any unfixed tissue or organ (other than intact skin) from a human (living or dead)
- HIV- or HBV-containing cultures (cell, tissue, or organ), culture medium, or other solutions
- blood, organs, & tissues from animals infected with HIV, HBV, or BBPs

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“OPIM include certain body fluids or tissues that may contain bloodborne pathogens, such as”

(Run through the list.)

“Other body fluids and materials, such as saliva, tears, urine, and feces, are not considered OPIM unless they are contaminated with blood or with the OPIM body fluids or tissues listed on this slide.”

Transmission of BBPs



Bloodborne Pathogens can enter your body through

- a break in the skin (cut, burn, lesion, etc.)
- mucus membranes (eyes, nose, mouth)
- sexual contact
- other modes

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“In an infected person, bloodborne pathogens are transmitted to another person when infected blood or body fluids (OPIM) can gain entry through another person’s blood, mucus membranes, or by sexual contact. For example: if you get cut with an object (needle, scalpel, glass, etc.) that is contaminated with infected blood or OPIM, or if infected body fluid splashes into your eyes.

“Intact skin will prevent the transmission of bloodborne pathogens because BBPs cannot penetrate intact skin. Non-intact skin – skin that is chapped (cracked) or has cuts, abrasions, lesions, acne, or other openings, or is afflicted with dermatitis – will not. You can, however, become potentially infected if you have infected blood or OPIM on intact skin, for example on your hand, and then you rub your eyes, thus allowing a route of entry through the eyes.

“Other modes of transmission will be discussed when we go over the individual BBPs of concern.”

Transmission of BBPs

Risk of infection depends on several factors:


- The pathogen involved
- The type/route of exposure
- The amount of virus in the infected blood at the time of exposure
- The amount of infected blood involved in the exposure
- Whether post-exposure treatment was taken
- Specific immune response of the infected individual

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“Most exposures do not result in infection. Following a specific exposure, the risk of infection may vary with factors such as

- The pathogen involved
- The type or route of exposure
- The amount of virus in the infected blood at the time of exposure
- The amount of infected blood involved in the exposure
- Whether post-exposure treatment was taken
- The immune status and specific response of the infected individual


(Note: the graphic shows the tip of an injection needle.)



Bloodborne Pathogen Diseases

Some examples of bloodborne pathogens:

- Malaria
- Syphilis
- Brucellosis
- Leptospirosis
- Arboviral infections
- Relapsing fever
- Creutzfeld-Jakob Disease
- Viral Hemorrhagic Fever



| Main bloodborne pathogens and diseases of concern | |
|---|---------------|
| • Hepatitis B Virus (HBV) | – Hepatitis B |
| • Hepatitis C Virus (HCV) | – Hepatitis C |
| • Human Immunodeficiency Virus (HIV) | – AIDS |

“Some examples of BBPs are *(run through list)*.


“The main bloodborne pathogens of concern that we are going to go over today are Hepatitis B Virus, Hepatitis C Virus, and Human Immunodeficiency Virus (HIV), which causes Acquired Immunodeficiency Syndrome or AIDS.”

(Note: A person can have co-infections - two or more infections in the body at the same time. For example, a person having HIV/HCV co-infection has both HIV and HCV.)

Viral Hepatitis - General Overview

NATIONAL Safety

- Virus attacks liver → inflammation, enlargement, and tenderness
- Acute and chronic infections
- Possible liver damage ranging from mild to fatal



The liver is a large, dark red gland located in the upper right abdomen behind the lower ribs. It functions in removing toxins (poisons) from the blood, in the digestion of fats, and in other body processes.

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“Hepatitis viruses are very infectious organisms that attack the liver, causing inflammation of the liver and often enlargement and tenderness of the liver.

“Viral hepatitis infections can be acute (short-term) or some can become chronic (long-term) and last the rest of one’s lifetime.

“Hepatitis infection can result in liver damage that is mild, severe, or fatal.

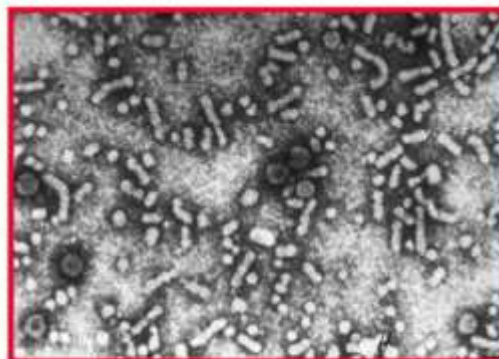
“Let’s look at Hepatitis B.”

HBV - Hepatitis B

General Facts

- Hearty - can live for 7+ days in dried blood
- 100 times more contagious than HIV
- Approximately 78,000 new infections per year (2001)
- 1.25 million carriers
- 5,000 deaths/year
- No cure, but there is a preventative vaccine

Hepatitis B Virus



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“The Hepatitis B virus can survive outside the body for more than 7 days in a dry state on a surface, for instance on a counter top or discarded hypodermic needle.

“HBV is 100 times more contagious than HIV.

“The number of new infections per year has dropped considerably since the 1980’s to about 78,000 in 2001. The highest rate of disease occurs in 20–49 year olds.

“There are an estimated 1.25 million chronically infected Americans who are carriers. Those with chronic hepatitis infection are at higher risk for liver diseases, such as cirrhosis and liver cancer (at 12-300x risk than non-carriers). *(Cirrhosis is irreversible scarring of the liver. When liver inflammation doesn’t subside but persists, it leads to the destruction of working liver cells. When these cells die, they are replaced by scar tissue, resulting in its failure to perform many of its usual functions.)*

“Approximately 5000 die per year from the disease or later complications such as liver cancer in the U.S.

“There is no cure, but there is a vaccine that can prevent you from getting infected, and is effective before or after exposure. I will discuss the vaccine further later in this presentation.”

| HBV - Hepatitis B | |
|--|---|
| Clinical Features | |
| Incubation period | Average 60-90 days Range 45-180 days |
| No sign or symptoms | 30% |
| Acute illness (jaundice) | 30%-50% (≥ 5 years old) |
| Chronic infection (carrier) | 2%-10% (of infected adults) |
| - Premature death from chronic liver disease | 15-25% (of chronically infected) |
| Immunity | Protected from future infection |

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“The incubation period (the time between initial contact with the virus and onset of the disease) varies from 45 to 180 days and averages 60-90 days. Onset of acute disease is generally gradual.

“About 30% of infected persons show no sign or symptoms. The course and outcome of HBV infection vary substantially depending on the age at which infection occurs. Clinical illness associated with acute infection (jaundice) occurs in 30%-50% of older children and adults.

“About 0.5%-1% of infected persons do die from acute illness, but most acute HBV infections in adults result in complete recovery with immunity from future infection.

“However, up to about 10% of adults who are infected with HBV develop chronic infection and become carriers. Most of the serious consequences associated with HBV occur in these persons, who have recurring episodes of the disease for life and remain potentially infectious. Persons with chronic HBV infection often have no symptoms, but these persons are at high risk for developing chronic hepatitis B, and approximately 15%-25% may die prematurely from either cirrhosis or liver cancer.

“After you have a Hepatitis B infection, you are immune (protected) from any future Hepatitis B infections.”

HBV - Hepatitis B



Symptoms

- flu-like symptoms
- fatigue
- abdominal pain
- loss of appetite
- nausea, vomiting
- joint pain
- jaundice



Normal eyes




Jaundiced eyes

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“Symptoms of Hepatitis B viral infection may include

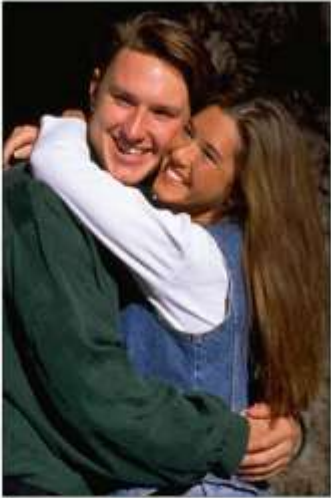
- fatigue
- abdominal pain
- loss of appetite
- nausea, vomiting
- joint pain
- jaundice

(Jaundice is a yellowing of the skin, sclera or “whites” of the eyes, and mucous membranes. It is due to an increase in bile pigments in the blood resulting from failure of the liver cells to function properly.)



HBV - Hepatitis B

HBV Transmission



- Unprotected sex with multiple partners
- Sharing needles during injecting drug use
- From infected mother to child during birth
- Sharps/needle sticks

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“HBV is spread from one person to another through blood to blood and sexual contact in blood, semen, and vaginal fluid. In the United States, the most important route of HBV transmission is by sexual contact, either heterosexual or homosexual, with multiple partners without using a condom.

“Sharing needles and syringes during injecting drug use is also an important mode of spread.

“Transmission can occur during birth from a chronically infected mother to her infant, most commonly by contact of maternal blood to the infant's mucous membranes at the time of delivery.

“Transmission of HBV may occur by needlesticks or other injuries from sharp instruments on the job. Other parenteral exposures, meaning a piercing through the skin, may include tattooing, ear piercing, and acupuncture. However, these exposures account for only a small proportion of reported cases in the United States.

“Saliva can be a vehicle of transmission through bites; however, transmission has not been documented to occur as a result of other types of exposure to saliva, including kissing. Tears, sweat, urine, feces, and breast milk have not been associated with transmission.”

HCV - Hepatitis C



General Facts

- The most common chronic bloodborne infection in the U.S.
- 3.9 million (1.8%) Americans infected; 2.7 million chronically infected
- 25,000 new infections per year (2001)
- Leading cause of liver transplantation in U.S.
- 8,000-10,000 deaths from chronic disease/year
- No broadly effective treatment
- No vaccine available



Healthy human liver



Hepatitis C liver

A healthy human liver contrasted with a liver from an individual who died from hepatitis C. Note the extensive damage and scarring from chronic liver disease.

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“Hepatitis C virus (HCV) is the most common chronic bloodborne infection in the United States.

“An estimated 3.9 million (1.8%) Americans have been infected with HCV, of whom 2.7 million are chronically infected.


“The number of new infections per year has declined since the 1980s to about 25,000 in 2001.

“HCV may be responsible for 40%-60% of all chronic liver disease in the United States, and it may be as important as alcohol as a cause of chronic liver disease. It is the leading indicator for liver transplant in the U.S.

“It is estimated that 8,000-10,000 deaths may be related to chronic HCV infection each year - about twice the number that are attributable to chronic HBV infection (5,000/year).

“There is no broadly effective treatment and there is no vaccine available currently.

(According to CDC Hepatitis C Fact Sheet and FAQ)

| HCV - Hepatitis C | |
|---|---|
|  | |
| Clinical Features | |
| Incubation period | Average 6-7 weeks Range 2-26 weeks |
| No sign or symptoms | 80% |
| Acute illness (jaundice) | ≤20% (Mild) |
| Chronic infection | <div> <div></div> <div>Age-related</div> </div> 75%-85% |
| Chronic liver disease | |
| Deaths from chronic liver disease | 1%-5% |
| Immunity | No protection from future infection identified |

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“The average incubation period for hepatitis C is generally 6-7 weeks with a range of 2 weeks to 26 weeks.

“About 80% of persons having an acute infection show no signs or symptoms, with about 20% having jaundice and mild symptoms.

“It’s rare that death from acute liver failure from hepatitis C occurs. However; the long term effects are that up to 85% of persons infected with HCV may develop life-long chronic infection and become carriers - these persons are at risk for developing cirrhosis and liver cancer. In comparison to the Hepatitis B virus, although the percentage of people who are carriers is higher with Hepatitis C, the infectivity, or probability of infecting others, is low; the infectivity is high for HBV.

“70% of chronically infected persons may develop chronic liver disease; signs and symptoms may not appear until 10 years after infection. 20% of chronically infected persons may develop cirrhosis of the liver over a period of 20 to 30 years.

“1% to 5% of persons may die from the consequences of long term infection (liver cancer or cirrhosis).

“No protective antibody response has been identified following HCV infection.”

HCV - Hepatitis C



Symptoms

- flu-like symptoms
- jaundice
- fatigue
- dark urine
- abdominal pain
- loss of appetite
- nausea



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“Symptoms of Hepatitis C viral infection may include

- flu-like symptoms
- jaundice
- fatigue
- dark urine
- abdominal pain
- loss of appetite
- nausea

“Remember that most people don’t have any symptoms.”

HCV - Hepatitis C



HCV Transmission



- Injecting drug use
- Hemodialysis (long-term)
- Blood transfusion and/or organ transplant before 1992
- From infected mother to child during birth
- Occupational exposure to blood - mostly needlesticks
- Sexual or household exposures - rare

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“HCV is spread through blood to blood and sexual contact in blood, semen, and vaginal fluid.

“Percutaneous exposures are the most efficient modes of HCV transmission. Most infections (60%) are due to illegal injection drug use. HCV can be spread not only just from needles and syringes, but also contamination of drug paraphernalia. HCV transmission from injecting drug use is four times more common than HIV.

“HCV can be transmitted if you were ever on long-term kidney dialysis from unknowingly sharing supplies/equipment that had someone else's blood on them. Transfusion and organ transplant associated cases are rare now after blood donor screening was started in 1992; the chance of getting infected from transfused blood or blood products is less than 1 per million units transfused.

“About 5 out of every 100 infants born to HCV-infected women become infected. This occurs at the time of birth, and there is no treatment that can prevent this from happening.

“HCV transmission may occur through needlestick injuries and sharps exposures on the job.

“HCV can be spread by sex, but this is very rare. If you have multiple partners, you and your partners can get other diseases spread by having sex (e.g., AIDS, hepatitis B, etc.). HCV transmission within a household does not occur very often. If HCV is spread within a household, it is most likely due to direct exposure to the blood of an infected household member.

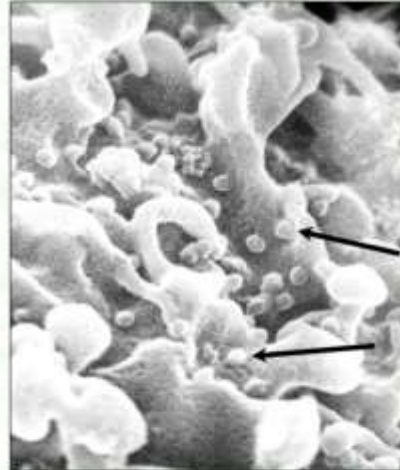
“HCV is not spread by kissing, hugging, sneezing, coughing, food or water, sharing eating utensils or drinking glasses, or casual contact.”

Human Immunodeficiency Virus (HIV)



General Facts

- Fragile – few hours in dry environment
- Attacks the human immune system
- Cause of AIDS
- >1 million infected persons in U.S.
- No cure; no vaccine available yet



HIV - seen as small spheres on the surface of white blood cells

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“The Human Immunodeficiency Virus, HIV, is fragile compared to HBV. It does not survive well outside the body and can live in a dry environment for only a few hours. No one has yet been identified as infected with HIV due to contact with an environmental surface.

“HIV attacks your body’s ability to protect itself from disease. It destroys the human immune system by attacking certain cells known as T cells, which are part of the first line of defense that our immune system has to fight infection.

“HIV is the cause of Acquired Immunodeficiency Syndrome, or AIDS.

“There are now more than one million HIV-infected persons in the US.

“There is no cure and no vaccine available yet.”

Human Immunodeficiency Virus (HIV)



HIV Infection → AIDS

- Many have no symptoms or mild flu-like symptoms
- Most infected with HIV eventually develop AIDS
- Incubation period ≈10-12 yrs
- Opportunistic infections & AIDS-related diseases - TB, toxoplasmosis, Kaposi's sarcoma, oral thrush (candidiasis)
- Treatments are limited; do not cure



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“Many people who are infected with HIV do not have any symptoms at all for many years or may have mild flu-like symptoms.

“Most persons who become infected with HIV will eventually develop AIDS, which is the most advanced stages of the infection.

“There is usually a latency (inactive) period of years before the onset of AIDS after the initial infection. Before 1996, scientists estimated that about half the people with HIV develop AIDS within 10 years after becoming infected. Some have progressed to AIDS within 2-3 years after infection while very few have had no symptoms after 12 years. The time varies greatly from person to person and can depend on many factors, including a person's health status and health-related behaviors.

“NOTE: Since 1996, the introduction of powerful drug therapies has dramatically changed the progression time between HIV infection and the development of AIDS. There are also other medical treatments that can prevent or cure some of the illnesses associated with AIDS, though the treatments do not cure AIDS itself. Because of these advances in drug therapies and other medical treatments, estimates of how many people will develop AIDS and how soon are being recalculated, revised, or are currently under study.

“The only way to determine for sure whether you are infected is to be tested for HIV infection. You cannot rely on symptoms to know whether or not you are infected with HIV.

“Infection with HIV can weaken the immune system to the point that it has difficulty fighting off certain infections and cancers. These types of infections are known as "opportunistic" infection because they take the opportunity of a weakened immune system to cause illness. A healthy immune system can usually control these types of infections; however, in a person with AIDS, these opportunistic infections may be life-threatening.

Human Immunodeficiency Virus (HIV)



HIV Transmission



- Sexual contact
- Sharing needles and/or syringes
- From HIV-infected women to their babies during pregnancy or delivery
- Breast-feeding
- Needlesticks

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“HIV is spread from one person to another through blood to blood and sexual contact in blood, semen, vaginal fluid, breast milk, and other body fluids containing blood (CSF, synovial fluid, and amniotic fluid).

Transmission through transfusions of infected blood or blood clotting factors is less common and now very rare in countries where blood is screened for HIV antibodies.

Needlesticks - Most occupational exposures do not result in infection. As of December 2001, there have been 57 documented cases of HIV infection (since reporting began in 1985); 48 of the infections were from percutaneous (puncture/cut injury) exposure and 5 were mucocutaneous (mucous membrane and/or skin) exposure.

Casual contact is not a risk for transmission of HIV.

Transmission of BBPs



Occupational Exposure

- means reasonably anticipated skin, eye, mucous membrane, or parenteral (piercing of the skin) contact with blood or OPIM that may result from the performance of an employee's duties



Exposure Incident

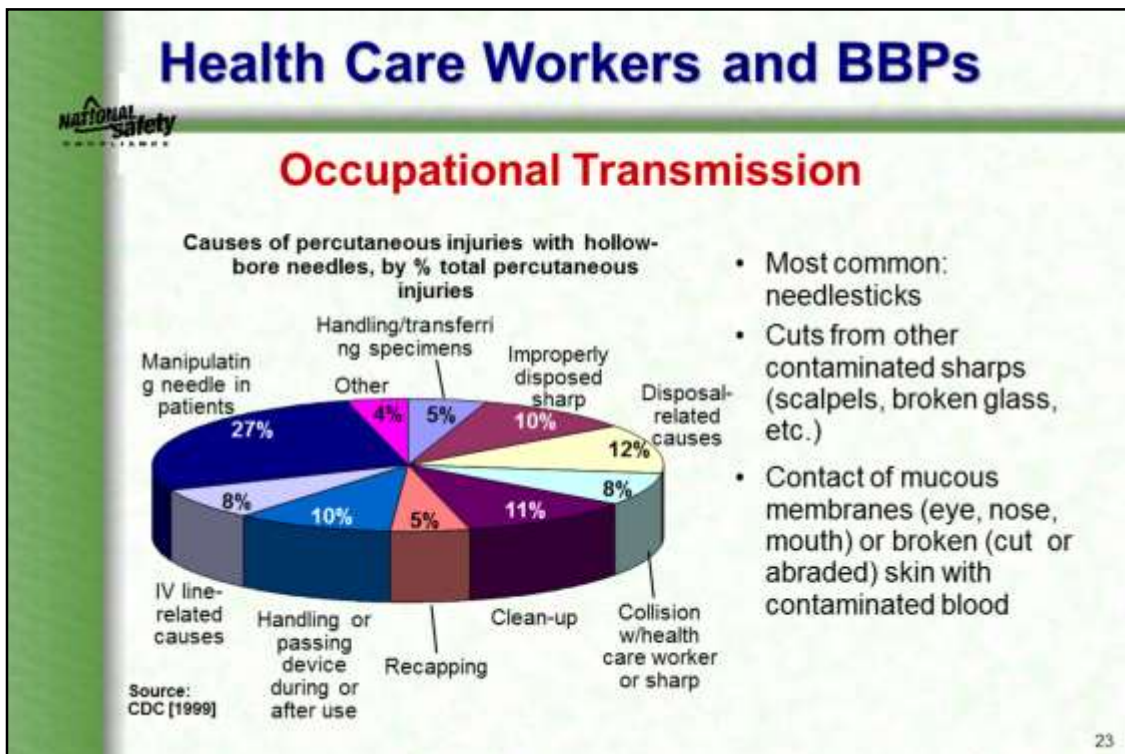
- is a specific contact with blood or OPIM that is capable of transmitting a bloodborne disease

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“At the workplace, Occupational Exposure means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or OPIM that may result while an employee is doing his or her job duties.” ‘Reasonably anticipated’ contact means potential contact as well as actual contact with blood or other potentially infectious materials.

“An Exposure Incident is a specific contact with blood or OPIM that is capable of transmitting a bloodborne disease.

(parenteral or percutaneous contact = contact through a piercing of the skin, such as by needlesticks, cuts, or abrasions)



“Needlestick injuries are the most common cause of occupational exposure to BBPs. Data from the CDC shows that approximately 38% of percutaneous injuries occur during use and 42% occur after use and before disposal. Most needlestick injuries have been associated with hollow bore needles. This chart shows the causes of needlestick injuries with hollow bore needles from CDC data over a four-year period (June 1995-July 1999).

“Other exposures from contaminated sharps may include scalpels, broken glass, broken capillary tubes, exposed ends of dental wires, and any other contaminated object that can penetrate the skin. Exposure can also occur from contact of the eye, nose, mouth, or non-intact skin with contaminated blood.”



Health Care Workers and BBPs

Occupational Transmission



Risk of infection following needlestick/cut from a positive (infected) source:

- HBV: 6%-30%
- HCV: 1.8%
(range 0%-7%)
- HIV: 0.3%

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“For an unvaccinated person and who has no immunity from a previous infection, the risk for HBV infection from a single needlestick or a cut exposure to HBV-infected blood ranges from 6-30%. Health-care workers who have received hepatitis B vaccine and have developed immunity to the virus are at virtually no risk for infection.

“The risk for HCV infection after a needlestick or cut exposure to HCV-infected blood averages 1.8%. The risk following a blood splash is unknown, but is believed to be very small; however, HCV infection from such an exposure has been reported.

“The risk for HIV infection after a needlestick or cut exposure to HIV-infected blood is 0.3%, or about 1 in 300. The risk after exposure of the eye, nose, or mouth to HIV-infected blood is estimated to be, on average, 0.1%. (As of December 2001, there have been 57 documented cases of HIV infection (since reporting began in 1985); 48 of the infections were from percutaneous (puncture/cut injury) exposure and 5 were mucocutaneous (mucous membrane and/or skin) exposure.)



Exposure Control Plan

To eliminate/minimize your risk of exposure



- Exposure determination
- Exposure controls
- Training and Hazard Communication
- Hepatitis B Vaccine
- Post exposure evaluation & follow-up
- Recordkeeping


Location...

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“A copy of *(state your company name)*’s written Exposure Control Plan is located at *(describe the exact location(s) where employees can access it)*. The Exposure Control Plan is designed to eliminate or minimize your risk of exposure to BBPs at work. It includes our policies and procedures, and also identifies persons or departments with specific responsibilities. You should familiarize yourselves with it and refer to the procedures to follow if an exposure incident occurs. If you have any questions concerning the Exposure Control Plan, see *(state the name of the responsible person or department)*).

“Briefly, the Exposure Control Plan contains the following elements:

- An exposure determination to identify employees who are at risk for exposure
- The methods and controls we use to protect you from exposure to bloodborne pathogens
- Training and Hazard Communication requirements
- Post-exposure evaluation and follow-up procedures if you experience an exposure incident
- Record keeping, including documentation of any occupational exposure incidents



Exposure Determination

Who is at risk on-the-job?

In which job classifications here are ...

- All employees occupationally exposed?
- Some employees occupationally exposed?
 - What are the tasks with exposure?

**Determine exposure without considering the use of PPE.*

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(Here is an opportunity to have some interaction with the employees. Ask these questions and encourage discussion. You can list their answers on a flip chart, overhead, dry-erase board, etc. Alternatively, you can use the following slide; modify it as needed.

Discuss how to recognize the tasks and other activities that could involve exposure to blood and OPIM.)

“Let’s identify those employees who are at risk for exposure here. Do we have job classifications where all employees are occupationally exposed?”

“Do we have job classifications where some employees are occupationally exposed? What tasks or procedures could these employees have exposure to blood and OPIM?”

(For example,

- Needlesticks (during or after use)
- Recapping
- Transferring a body fluid from a container
- Failing to properly dispose of used needles in a puncture-resistant sharps container
- Providing first-aid emergency treatment (by employees assigned as responders)
- Restraining a combative patient, suspect, or inmate
- Hotel workers who handle laundry
- Cleaning contaminated surfaces
- Disposing of hazardous waste
- Etc.

Exposure Determination



The following are job classifications in our establishment in which **ALL** employees have occupational exposure to bloodborne pathogens:

| Job Title | Department/Location |
|--------------------------------|--------------------------------|
| <i>(example: Phlebotomist)</i> | <i>(example: Clinical Lab)</i> |
| | |
| | |

The following are job classifications in our establishment in which **SOME** employees have occupational exposure to bloodborne pathogens:

| Job Title | Department/Location | Task/Procedure |
|-------------------------------|---------------------------------|-----------------------------------|
| <i>(example: Housekeeper)</i> | <i>(Environmental services)</i> | <i>(Handling Regulated Waste)</i> |
| | | |
| | | |

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(You can choose to use this slide. Modify it as needed and fill in the tables.)

(Encourage discussion. Explain how to recognize the tasks and other activities that could involve exposure to blood and OPIM.)

Exposure Controls

Reducing your risk

- Universal precautions (or equivalent system*)
- Equipment and Safer Medical Devices
- Work practices
- Personal protective equipment
- Housekeeping
- Laundry handling
- Hazard communication - labeling
- Regulated Waste



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“The risk of occupational exposure to BBPs can be reduced or prevented by these methods, which we will discuss further:

- following universal precautions
- using safer medical devices and equipment
- following proper and safe workplace policies, practices, and procedures
- using appropriate PPE when contact with blood or OPIM is expected
- maintaining a clean workplace
- making sure all contaminated materials are properly labeled

(*Note: Standard Precautions, Blood-body Fluid Precautions, and Body Substance Isolation are acceptable systems in lieu of Universal Precautions. Modify this slide if your company follows one of these systems.)

(Make sure you delete any slides that do not apply to your work place, and modify or add any slides containing information specific to your workplace conditions, control systems, procedures, etc.)


Exposure Controls

NATIONAL Safety

UNIVERSAL PRECAUTIONS

– A system of infection control:

TREAT **ALL HUMAN BLOOD AND OPIM** AS IF KNOWN TO BE INFECTIOUS WITH A BLOODBORNE DISEASE.



A rectangular sign with a black border. At the top, the word "DANGER" is written in white inside a red oval. Below this, the words "BIOHAZARD" and "INFECTIOUS WASTE" are written in black. In the center, there is a red biohazard symbol consisting of three interlocking circles.

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“(State your company name here) follows Universal Precautions. The concept of universal precautions is an infection control system that considers blood and other potentially infectious materials (OPIM) from all persons as containing a bloodborne disease, whether or not the person has been identified as having a bloodborne disease. Therefore, you must handle all such materials using methods that prevent or reduce the risk of exposure to yourself. Observe and follow Universal Precautions in all situations where there is a potential for contact with blood or OPIM.”

*(*Modify this slide if your company follows Standard Precautions, Blood-body Fluid Precautions, or Body Substance Isolation system.)*

Exposure Controls



Equipment and Safer Medical Devices

• Physical guard

Sharps disposal containers

- Closable
- Puncture-resistant
- Leak-proof
- Labeled or color-coded
- Upright, conveniently placed in area where sharps used
- **DO NOT OVERFILL!**



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“The use of safer medical devices and equipment will prevent or minimize your exposure to bloodborne pathogens by eliminating, removing, or isolating the BBP hazard from the work area. These include physical guards, barriers, environmental controls, or other devices.

“An example of a physical guard is a sharps disposal container. It must be closeable, puncture resistant, leak-proof, and labeled or color coded.

“During use, place them as close as feasible to the immediate area where sharps are used or anticipated to be found, keep them upright, and don’t allow them to overfill. Replace them regularly or sooner if necessary.

“If they need to be replaced or moved somewhere else, close them securely before you move them and place them in a larger secondary container if leakage is possible.”

Exposure Controls



Equipment and Safer Medical Devices

- Barrier Shields



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“Barriers protect you by providing a shield between you and an action that could cause an aerosol or splatter. This slide shows two types of shields.

“On the left is a simple, clear plastic panel that is formed to stand on its own and to provide a barrier between the activity of opening vacutainer tubes that contain blood.

“The other protective device is a shield over the opening of a centrifuge. This will help prevent splashing and splattering of material if a centrifuge tube breaks and loses its contents.”

Exposure Controls




Equipment and Safer Medical Devices

- Environmental Controls
- Ventilation Hood



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“An environmental control may include a biological safety cabinet which combines ventilation control and a barrier.”



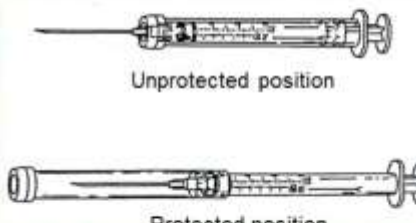
Exposure Controls

Equipment and Safer Medical Devices

- Other Devices

Safer Medical Devices

- Sharps with engineered sharps injury protections (SESIP)
- Needleless systems
- Self-blunting needles
- Plastic capillary tubes



Example of needle guard with protected sliding sheath that is pushed forward after use and locks (with some designs the shield must be twisted to engage the lock).

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“Safer medical devices have been developed to help prevent needle-stick injuries. They must be used where they can prevent or minimize occupational exposure to BBPs. Examples of safer medical devices may include

- “Sharps with engineered sharps injury protections, or SESIP. These are non-needle sharps or needle devices that have a built-in safety feature or mechanism that reduces the risk of an exposure incident, e.g., syringes with a hinged or sliding sheath that shields the attached needle after use; needles that retract into a syringe after use; shielded or retracting catheters; IV delivery systems that use a catheter port with a needle housed in a protective covering.
- “Needle-less systems, such as an IV system or jet injection system, that do not use needles for the collection or withdrawal of body fluids or for the administration of medication or fluids.
- “Self-blunting needles: after the final tube of blood is drawn, a blunt internal hub is activated by forward pressure of the vacuum tube, blunting the needle before it is removed from the patient.
- “Plastic capillary tubes, or capillary tubes that are coated with a special film to prevent shattering.

*(It is the employer’s responsibility to keep up to date on feasible and newer devices that prevent needlesticks and other injuries to reduce the risk to employees. **Additional Information About Safety Devices Available At...** www.med.virginia.edu/~epinetwww.tdict.org
www.osha.gov www.lni.wa.gov/wisha/*

[Device drawings courtesy of International Health Care Worker Safety Center, University of Virginia]

Exposure Controls



Safe Work Practices

Do the job/task in safer ways to minimize any exposure to blood or OPIM:



- Don't bend, recap, or remove needles or other sharps
- Don't shear or break needles
- Place contaminated reusable sharps immediately in appropriate containers until properly decontaminated

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“Safe work practices are steps, procedures, or ways in which a job or task can be done more safely to minimize any exposure to blood or OPIM.

(Work practices must be specific to each workplace and sets of procedures. Do not use generic language. There must be enough specific directions with different sorts of procedures to ensure uniformity. Every single procedure may not need a separate set of directions; you can combine similar tasks.)

Exposure Controls

Safe Work Practices

- Do not pipette or suction blood or OPIM by mouth.
- Wash hands after each glove use and immediately or ASAP after exposure.
- Remove PPE before leaving work area.



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(Note: If handwashing facilities are not possible or immediately available, waterless antiseptic hand cleanser and towels or towelettes must be available. When hands are visibly contaminated, follow with washing using soap and water as soon as possible.)

Exposure Controls

Safe Work Practices



- Do not eat, drink, smoke, apply cosmetics or lip balm, or handle contact lenses in any work areas where there is the possibility of exposure to blood or OPIM.
- Do not place food or drink in refrigerators, freezers, shelves, cabinets, or on countertops or bench tops in any work areas.

Exposure Controls

Safe Work Practices

Clean-up of spills and broken glassware/sharps contaminated with blood or OPIM



- Wear protective eyewear and mask if splashing is anticipated.
- Remove glass and other sharps materials using a brush and dust pan, forceps, hemostat, etc. **Do not use your hands.**
- Properly discard all materials into a sharps or puncture-resistant biohazardous waste container.
- Use paper/absorbent towels to soak up the spilled materials.

Exposure Controls


Safe Work Practices

Clean-up of spills and broken glassware/sharps (cont.)



- Clean the area with 10% bleach or EPA-registered disinfectant.
- Saturate the spill area with disinfectant. Leave for 10 minutes (or as specified by product manufacturer) or allow to air dry.
- Properly dispose of paper towels and cleaning materials into proper waste containers.

Exposure Controls




Personal Protective Equipment (PPE)

You must wear all required PPE. *(State your company's name)* provides you with the following PPE at no cost:

- Gloves
- Lab coats
- Gowns
- Shoe covers

- Face shields or
Masks and eye protection
- Resuscitation devices




PPE Contact: *(name of responsible person or department)*

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“When equipment, safer devices, and safe work practices do not eliminate exposure, the use of personal protective equipment, or PPE, is required. PPE that is “appropriate” will not permit blood or other OPIM to pass through or reach your clothes, skin, eyes, mouth, or other mucous membranes.

“We provide you with these PPE at no cost:

(Run through list; include those PPE and any additional types required at you workplace. Mention their locations.)

“(State name of responsible person or department) is responsible for maintaining supplies and providing PPE. See (person or department) if you need PPE or have any concerns regarding PPE types, use, sizes, etc.

“Make sure you remove all PPE before leaving the work area. Remove contaminated PPE carefully as to avoid contact with contaminated PPE surfaces and dispose in the designated containers *(describe/list which containers are used at your workplace)*

“The procedure for handling used PPE is:” *(For example, how and where to decontaminate face shields, eye protection, resuscitation equipment.)*



Exposure Controls

Personal Protective Equipment (PPE)

• Gloves

- Latex
- Nitrile
- Vinyl
- Utility



Nitrile and vinyl gloves



Boxes of latex gloves in glove dispensing rack

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“Gloves must be worn when hand contact with blood or OPIM can be reasonably anticipated or when you handle or touch contaminated items or surfaces. You must wear gloves when doing the following tasks/procedures: *(list/describe the tasks/procedures; for example, drawing blood, inserting IVs, etc.)*

“The types of gloves and other hand protection that are provided are *(latex, nitrile, vinyl, powderless, glove liners etc.)* Non-latex gloves are provided for those who are hyper-sensitive to latex.

“Don’t reuse disposable gloves. Change gloves frequently because they might develop pinhole leaks that are not visible but can allow passage of microscopic organisms. If you tear or damage your gloves, remove them and wash your hands thoroughly with soap and water before putting on a new pair and also between each glove use.

(Discuss other types of gloves, such as reusable utility gloves, that are used at your workplace. Make sure to talk about when these are used, and about disinfecting in between uses and replacing them before they start to show wear.)

Exposure Controls



Personal Protective Equipment (PPE)

Remove gloves safely and properly

- Grasp near cuff of glove and turn it inside out. Hold in the gloved hand.
- Place fingers of bare hand inside cuff of gloved hand and also turn inside out and over the first glove.
- Dispose gloves into proper waste container.
- Clean hands thoroughly with soap and water (or antiseptic hand rub product if handwashing facilities not available).



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“Make sure you remove your gloves safely and properly to avoid possible contact with blood or OPIM-contaminated gloves.

(Click on the yellow button to play a short narrated video clip demonstrating proper glove removal, or you may choose only to run through this slide instead.)

- “Remove the glove of one hand with the other by grasping near the cuff and turning the glove inside out. Hold it in the gloved hand.
- “Place the fingers of the bare hand inside the cuff of the gloved hand and also turn that inside out and over the first glove.
- “Dispose gloves into the proper waste container.”
- “Clean your hands thoroughly after each glove use with soap and water, or use an antiseptic hand rub product (“hand sanitizers”) if hand washing facilities aren’t immediately available. **If your hands are visibly contaminated and there are no washing facilities, use the antiseptic hand rub product followed by washing with soap and water as soon as possible.”**

Safe and proper glove removal



Exposure Controls

Personal Protective Equipment (PPE)

- Protective clothing

- Lab coat
- Gown
- Apron
- Surgical cap or hood
- Shoe cover or boot
- Fully encapsulated suit



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“(State the types of protective clothing provided at your workplace) are provided to you. You must wear them in (state the specific work areas.)”

“Remove, as soon as feasible, your protective clothing if blood or other potentially infectious materials (OPIM) penetrate it.”

“We launder the following contaminated articles: (List items laundered, e.g., lab coats, etc. and also the laundering schedule – time, location, etc.)”

(The amount of protection will depend on the risk and degree of potential splash. This requirement is performance-based. Caps or hoods and/or shoe covers have to be worn in instances when gross contamination can reasonably be anticipated.)

Exposure Controls



Personal Protective Equipment (PPE)

• Eye-Face Protection and Masks



- Safety glasses with side shields
- Splash goggles
- Face shield
- Mask



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“Wear appropriate face and eye protection when splashes, sprays, spatters, or droplets of blood or OPIM pose a hazard to the eye, nose, or mouth.

“Face shields would be needed if the risk and amount of potential splash or splatter to the face is substantial. The skin as well as the eyes needs to be protected.

“If the risk of splash is minimal, glasses with side shields might be adequate.

“Splash goggles or the use of a mask in combination with an eye protection device may be required in higher risk situations.

Exposure Controls



Personal Protective Equipment (PPE)

- Resuscitation Devices



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“When administering CPR, use gloves and resuscitation devices, such as mouthpieces, resuscitation bags, pocket masks, microshields, overlay barrier, etc.”

Exposure Controls

Housekeeping

Maintain a clean and sanitary workplace

- Written cleaning and decontamination schedule and procedures
- Approved disinfectant – bleach, EPA-approved
- Contaminated waste disposal methods
- Laundry



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“All work areas are to be maintained in a clean and sanitary condition.

“A written schedule and detailed procedures for cleaning and decontamination is posted/located at *(state location where maintenance schedule is placed in the work areas or in procedure manuals, policies, etc.)*”

“Decontaminate all work surfaces with the appropriate disinfectant after completion of procedures, when surfaces are contaminated, and at the end of each work shift.

The appropriate disinfectant is an *EPA-approved tuberculocidal or HIV/HBV-effective disinfectant, or a diluted (1:10 for spills, 1:100 for routine cleaning) bleach solution made daily.

(Lists of disinfectants are available from the EPA Office of Pesticides, antimicrobial pesticides website at <http://www.epa.gov/oppad001/chemregindex.htm>.)

Exposure Controls



Laundry

- Contaminated articles: *(list items that are laundered)*
- Handle as little as possible
 - Bag/containerize where used
 - Don't sort or rinse where used
 - Place in leak-proof, labeled or color-coded containers or bags
- Wear PPE when handling and/or sorting:
 - Gloves
 - Gown
- Schedule *(Time, location)*



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“Contaminated laundry needs to be handled as little as possible and bagged or containerized where it was used. Don't sort or rinse where items were used.


“Containers or bags must be labeled or red color-coded.

“Wear the following PPE when handling and/or sorting contaminated laundry:

- Gloves
- Gown
- Face shield
- Etc.

(If all soiled laundry is handled using universal precautions, then alternative, identifiable color coding may be utilized instead of labels.

(Laundry shipped off-site must be labeled or red color coded unless the receiving facility utilizes universal precautions for all laundry. The receiving laundry must be notified.)




Exposure Controls

Communication of Hazards

Biohazard Labels and Signs

- Must have biohazard symbol
- Labels attached securely to any containers or items containing blood/OPIM
- Red bags/containers may substitute for labels
- Signs posted at entrance to specified work areas



Predominantly
fluorescent orange or
orange/red background

Lettering and symbol
in contrasting color to
background

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“Containers containing blood or OPIM, or equipment contaminated with blood/OPIM must have this orange/red label with the biohazard symbol. The following must be labeled:

- regulated waste disposal
- sharps containers
- containers used to store, transport or ship (e.g., freezers)
- laundry
- contaminated equipment
- etc.

“The labels must be attached with string, wire, adhesive, or other method so they can't become lost or accidentally removed.

“Red bags or red containers may be substituted for labels. We use red bags for (*list, e.g., laundry, etc.*)

Exposure Controls

Regulated Waste

- 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 caked with dried blood or OPIM that are capable of releasing these materials during handling
- Contaminated sharps
- Pathological and microbiological wastes containing blood or OPIM



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“Regulated waste is one that poses a significant risk of exposure to workers, including those who may handle the waste downstream.

“Regulated waste includes

- liquid or semi-liquid blood or OPIM
- contaminated items that would release liquid or semi-liquid blood or OPIMs if compressed or compacted
- dried caked blood or OPIM that might flake off or be released if handled
- contaminated sharps
- and pathological and biological items or waste with blood or OPIMs.

“This does not include materials that sufficiently absorb blood or OPIM. For example, band aids and feminine hygiene products are not regulated waste.

“All contaminated waste must be handled in a sanitary manner. Waste containers must be lined and regularly disinfected.

Exposure Controls

Regulated Waste - Containers



- Easily accessible
- Labeled or color-coded
- Leak-proof, closeable
- Puncture-resistant for sharps
- Replaced routinely (do no overfill!)




Exposure Controls

Regulated Waste - Containers

- Close immediately before removing or replacing
- Place in second container if leaking possible or if outside contamination of primary container occurs
- If reusable, open, empty, and clean it in a manner that will not expose you and other employees



Hepatitis B Vaccine



- No cost to you
- 3 shots: 0, 1, & 6 months
- Effective for 95% of adults
- Post-vaccination testing for high risk HCW
- Post-exposure treatment (if not vaccinated)
 - Immune globulin
 - Begin vaccination series
- If decline, must sign Declination Form
 - vaccine available at later date if desired

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“Hepatitis B vaccine is provided free of charge to all employees at risk for exposure to BBP. You should make an appointment at *(state name and location where employees must go to receive treatment)*.

“The vaccination consists of a series of three different shots given at 0, 1 and 6 months and is highly effective. *(Booster shots are not required, unless recommended by CDC in the future.)*

“Post-vaccination testing will be given 1-2 months after the third vaccine dose for high risk health care workers (i.e., those who are at risk for sharps injury)

“If you have have an exposure incident and have not been vaccinated, the treatment will usually include Hepatitis B immune globulin and the vaccination series. Post-exposure prophylaxis is more than 90% effective in preventing HBV infection.

“If you choose to decline the vaccination now, you must sign a Declination Statement. However, if you decide later at any time that you would like to have the Hepatitis B vaccination, it will still be available under these same conditions.

The most common side effects from hepatitis B vaccination are pain at the injection site and mild to moderate fever (50--55). Studies indicate that these side effects are reported no more frequently among persons vaccinated than among those receiving placebo (51,52)

Serious adverse effects from HBIG when administered as recommended have been rare. Local pain and tenderness at the injection site, urticaria and angioedema might occur; anaphylactic reactions, although rare, have been reported following the injection of human immune globulin (IG) preparations (72).

Exposure Incident



If you have an exposure incident to blood or OPIM, immediately do the following:



- Thoroughly clean the affected area
 - Wash needlesticks, cuts, and skin with soap and water
 - Flush with water splashes to the nose and mouth
 - Irrigate eyes with clean water, saline, or sterile irrigants
- Report exposure to (*supervisor, person or department responsible for managing exposures, etc.*); fill out an Incident Report Form

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(Run through slide)

•“In the Incident Report Form, try to describe the exposure event in as much detail as possible and submit the report to (*your supervisor, responsible person or department, etc.*)

Post-exposure evaluation



Employer's Responsibility:

- Provide immediate post-exposure medical evaluation and follow-up to exposed employee:
 - At no cost
 - Confidential
 - Testing for HBV, HCV, HIV
 - Preventive treatment when indicated
- Test blood of source person if HBV/HCV/HIV status unknown, if possible; provide results to exposed employee, if possible



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Medical evaluation must be provided as soon as possible. Even though there is no clear recommendation as to how soon HIV post-exposure prophylaxis (PEP) must be given to be effective, most health care professionals recommend the HIV PEP be given within hours after exposure. There is no evidence that HIV PEP is effective if given longer than 24 hours after exposure. HBV immune globulin may be given within 7 days after exposure but is most effective given as soon as possible after exposure. There is no post-exposure preventative medicine that is available for HCV.

Post-exposure evaluation



Employers's Responsibility: (cont.)



- Provide exposed employee with copy of the evaluating health care professional's (HCP) written opinion within 15 days of completion of evaluation
- Provide employee with information about laws on confidentiality for the source individual
- Provide post-exposure treatment as needed, including counseling

Recordkeeping

Medical Records

- Confidential
- Hepatitis B vaccination and post-exposure evaluations
- HCP's written opinions
- Information provided to HCP as required
- Maintain for length of employment + 30 years



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Medical records maintained by (*state your company name*) do not contain any confidential medical information, except for the HBV vaccination status and Declination Form, if you choose to waive being vaccinated.

The HCP's written opinions contain generic information. They may not contain any medical diagnosis or disease testing results; these are your confidential medical information.

Recordkeeping

Training Records

- Dates
- Content summary
- Trainer name & qualifications
- Attendee's names & job titles
- Maintain for 3 years



Any Questions?

