

Introduction – BBP 1910.1030



- **Bloodborne Pathogens:**
 - Exposure to blood and bloodborne pathogens may occur as part of field work
 - Pathogenic microorganisms in human blood and other infectious materials can be transmitted from one person to another and cause disease
 - Hepatitis B (HBV) and Human immunodeficiency virus (HIV) are bloodborne pathogens
 - You must take precautions to protect yourself from disease transmission when working in the field
 - Infection can occur from a single exposure incident.

Learning Objectives



- At the end of this module, you will be able to:
 - List examples of potentially infectious materials
 - Explain how infections occur and identify the most significant modes of transmission
 - Identify measures for controlling exposure to **bloodborne pathogens**
 - Identify proper decontamination and handling of waste/material contaminated with blood or other potentially infectious materials.
 - Explain the process of immunization against hepatitis B and the medical evaluation that should follow any exposure incident.

How Infections Occur: Modes of Transmission



- The following conditions are required for the transmission of a disease from one person to another:
 - The pathogen must be present in a high enough concentration
 - The person must be susceptible to the pathogen
 - The pathogen must pass through the correct entry site.
- If any one of the conditions is missing, and infection cannot occur.

Elements of Bloodborne Disease Transmission

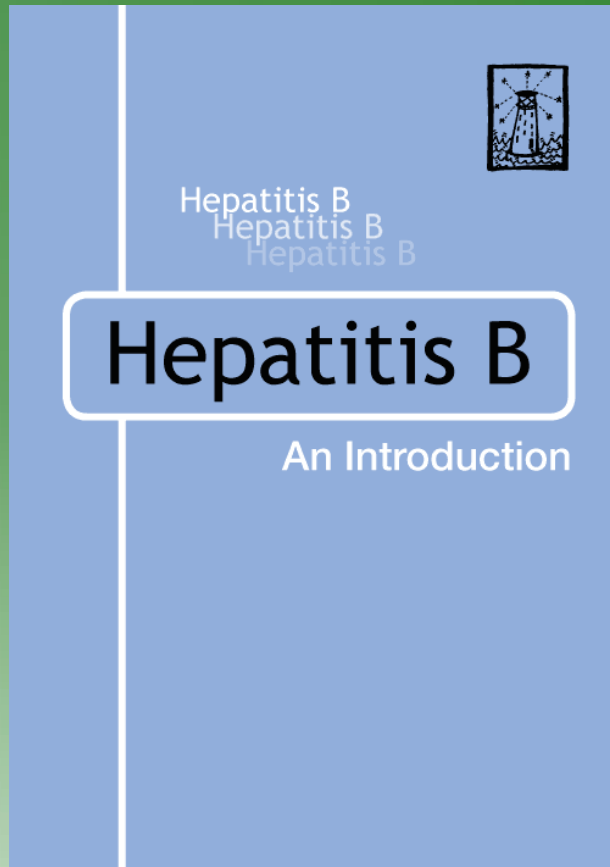


- The elements involved in the transmission of bloodborne diseases are potentially infectious material and routes of entry.
- Transmission cannot occur through casual contact such as shaking hands or sharing a glass.

Test your knowledge

- In addition to blood, which items on this list may pose the dangers of bloodborne pathogens?
 - Hair and nails
 - Peritoneal fluid
 - Cerebrospinal fluid
 - Perspiration
 - Pericardial fluid
 - Any fluid contaminated with blood

Bloodborne Diseases of Concern



- Two of the more serious bloodborne diseases that can affect workers and field personnel are hepatitis B and acquired immunodeficiency syndrome (AIDS).

Test your knowledge

- For each of the statements below, click on the statement to see whether it is true of **HIV** or **HBV**.
 - Infection with this virus can be prevented with a vaccine.
 - This virus attacks the white blood cells and weakens the immune system.
 - This virus is unlike any other known virus, and currently is incurable.
 - This virus causes severe liver disease and can lead to cancer of the liver.
 - Patients with this virus are vulnerable to many diseases and infections.
 - This virus can survive at room temperature for up to seven days.

Protection from Bloodborne Pathogens



- Employers whose workers may be exposed to bloodborne pathogens are required by the Occupational Safety and Health Administration (OSHA) to develop a written Exposure Control Plan.
- This plan must:
 - Serve to protect personnel from the health hazards associated with bloodborne pathogens
 - Contain a schedule and methods of implementation for each element of OSHA regulation (29 CFR 1910.1030).

Exposure Control Plan



- An effective exposure/infection control plan must:
 - Provide affected personnel with guidelines and procedures that address each of the elements identified
 - Include an exposure determination, which identifies all the job classifications and job tasks in which employees have occupational exposure.
 - Describe the procedures for hepatitis B immunization and the medical evaluation and follow-up should an exposure incident occur.

Universal Precautions



- Universal precautions is the name for a strategy that stresses that all blood and certain body fluids should be handled as if they are infectious for HIV and other bloodborne pathogens.

Test your knowledge

- Universal precautions means:
 - All blood and other body fluids should be treated as though they are infectious.
 - Only body fluids that are visibly contaminated with blood are infectious.
 - All blood should be tested for possible contamination with bloodborne pathogens.

Engineering Controls and Work Practice Controls



- Engineering controls include any controls that either remove the pathogen or isolate the worker from the pathogen. When used in conjunction with safe work practices, these controls are expected to be the primary means of protecting personnel from occupationally acquired infections and illnesses.

Engineering Controls



- Examples of engineering controls may include:
 - Sharp containers to store potentially contaminated needles and other sharp objects.
 - Mechanical needle recapping devices
 - Local exhaust ventilation when handling blood or blood products.

Work Practice Controls

□ Work practice controls may include the following:

- Use of adequate handwashing facilities/materials
- Proper handling and storage of contaminated needles and other sharps
- Prohibition of eating, drinking, smoking, etc., in areas where there is potential for exposure to blood or other potentially infectious materials
- Cleaning and disinfection of all equipment and work surfaces that may be contaminated
- Proper packaging of blood and other potentially infectious materials, including regulated waste, for shipping and transport.



Test your knowledge

Needles, syringes, and blades have to be disposed of in puncture-resistant containers.

True

False

Personal Protective Equipment (PPE)



- If occupational exposure to bloodborne pathogens still exists after institution of engineering and work practice controls, then personal protective equipment must also be used.
- **PPE** will be considered appropriate only if it does not permit blood or other potentially infectious materials to pass through or reach the employee's clothing, skin, or mucous membranes like the eyes and mouth. The PPE must remain effective under normal conditions of use and for the duration of time used.
- PPE should be used when handling, transporting, decontaminating, or disposing of materials potentially contaminated with bloodborne pathogens.

Appropriate PPE



- Appropriate PPE may include:
 - Disposable gloves to prevent skin contact
 - Utility gloves for handling sharp objects (e.g., broken glass)
 - Gowns or lab coats to prevent contamination of street clothes
 - Face shields, masks and eye protection to protect against splashes, spray, etc., that might reach the mucous membranes
 - Disposable resuscitation masks or microshields for use during artificial respiration.

Test your knowledge

Gloves, lab, coat, and mouthpiece are three pieces of personal protective equipment that may be used when handling blood or potentially infectious body fluids.

True

False

Decontamination and Regulated Waste

- All equipment and environmental surfaces must be decontaminated after contact with blood or other potentially infectious materials and at the end of a procedure or work shift if contamination may be occurred.



General Guidelines for Cleanup/Decontamination Procedures

- Always put on the appropriate personal protective equipment prior to beginning decontamination procedures.
- Always pick up contaminated glass or sharps using mechanical means; never use your hands.
- Remove PPE when decontamination is complete. Remember to remove gloves last to prevent contamination of skin, and wash hands as soon as possible after removing the gloves. Place contaminated disposable PPE in a properly labeled leak-proof bag for disposal.
- Remove garments that have been penetrated/contaminated as soon as possible. If possible, dispose of these garments as waste in a properly labeled leak-proof bag.
- Wash and dry work uniforms according to the manufacturer's instructions, and brush and scrub boots with soap and hot water to remove contamination.

Cleanup/Decontamination of Blood or Other Body Fluid Spills

- There are five steps to be followed when cleaning blood or other fluid spills.

Step 1 Put on appropriate PPE.

Step 2 Clean up all visible material first.

Step 3 Place soiled towels in leakproof container.

Step 4 Decon entire area with 10:1 water:bleach solution.

Step 5 Place all contaminated items in leakproof container.



Cleanup/Decontamination of Blood or Other Body Fluid Spills

□ Review of the Five Steps

- 1. Put on appropriate protective equipment. [Note: personnel should consider the use of impermeable aprons/garments and boot covers if the amount of contamination is significant (e.g., large pools of blood).]**
- Clean up and remove all visible material first with disposal towels or other means that prevent direct skin contact with the blood.**
- Place soiled towels immediately in a leak-proof bag to prevent contamination with other surfaces.**
- Decontaminate the entire area with clean towels and a 1:10 solution of common household bleach and water.**
- When decontamination is complete, collect contaminated items and place in a labeled leak-proof bag for disposal.**

Equipment Decontamination Procedures



- Put on the appropriate protective equipment.
- Wash equipment thoroughly with a 1:10 solution of common bleach and water.
- Collect contaminated towels and waste and place in a leak-proof bag for disposal.

Decontamination Procedures for Bins, Pails, and Cans



- All bins, pails, cans, and similar receptacles intended for reuse which have a reasonable likelihood for becoming contaminated with blood or other potentially infectious materials must be inspected and decontaminated on a regularly scheduled basis. They should be cleaned and decontaminated immediately, or as soon as possible, upon visible contamination.

Regulated Waste Handling Procedures

- In addition to proper decontamination procedures, proper handling of regulated waste is essential in effective exposure control. You need to know what **OSHA** defines as regulated waste.



OSHA Regulated Wastes

- OSHA regulated wastes include:
 - Liquid or semi-liquid blood or other potentially infectious materials
 - Contaminated items that, if compressed, would release blood or other potentially infectious materials in a liquid or semi-liquid state
 - Items cakes with dried blood or other potentially infectious materials that are capable of releasing these materials during handling
 - Contaminated sharps
 - Pathological and microbiological waste containing blood or other potentially infectious materials.



Regulated Waste Handling

- All regulated waste must be placed in containers that are:



- Closable
- Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport, or shipping
- Color coded or labeled with the universal biohazard symbol, which is readily visible from all angles.

- Sharps containers must also be puncture resistant and leak proof on the sides and bottoms.

Regulated Waste Disposal

- Regulated waste must be disposed of in accordance with applicable federal, state and local regulations. However, depending on the quantity of waste generated the following disposal options may be applicable:

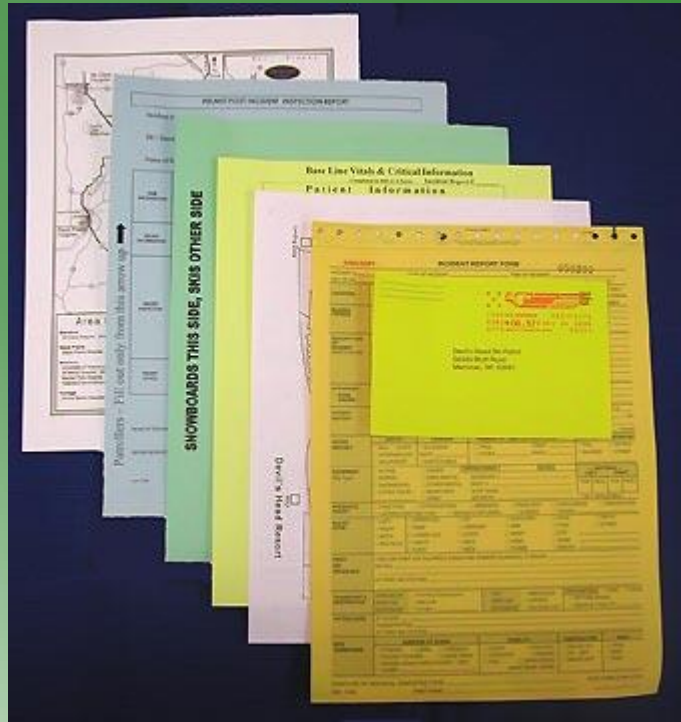


- Disposal of waste may be coordinated with the site/house medical facility
- Disposal may be contracted with a qualified commercial medical waste disposal firm.

Test your knowledge

- ❑ Waste containers for materials contaminated with bloodborne pathogens should be:
 - ❑ Closable, constructed to prevent leakage of fluids, and easy to carry
 - ❑ Constructed to prevent leakage of fluids, only 2/3 filled, and color-coded or labeled with the universal biohazard symbol.
 - ❑ Closable, constructed to prevent leakage of fluids, and color-coded or labeled with the universal biohazard symbol.

Employee Information and Training



- Field personnel should familiarize themselves with any site policies and procedures related to bloodborne pathogens prior to beginning work that may involve potential exposure to blood or other infectious materials.
- All personnel should ensure that they have access to the appropriate personal protective equipment and have been trained in the proper use and disposal of this equipment.
- Personnel should follow the general guidelines for cleanup and decontamination procedures and the disposal guidelines for regulated waste.

Hepatitis B Immunization



- ❑ OSHA requires that employers make the hepatitis B vaccine available, at no cost, to all personnel with potential occupational exposure to blood and/or body fluids.
- ❑ The Vaccine, administered as three injections in the arm over a 6-month time period, provides over 90% protections against hepatitis B for 7 or more years.

Special Considerations



- OSHA has added special considerations for employees who may provide first aid for incidents occurring in the workplace, although not required to do so. Because their routine work assignments do not include the administration of first aid, the risk of exposure is considered to be low.
- According to OSHA, these responders need only be offered the hepatitis B vaccine within 24 hour of exposure to blood or other potentially infectious material. In addition, the employers must meet other provisions of the OSHA standard.
- Personnel may decline the hepatitis B vaccination, and may request to be vaccinated at a later date. However, employees who choose not to receive the vaccine must sign a mandatory declination statement.

Test your knowledge

- If an employee works in an environment where there is a high risk of exposure to blood and/or body fluids, the employee:
 - Must receive a hepatitis B vaccination as required by OSHA.
 - Can only receive a vaccination for hepatitis B within 24 hours of exposure.
 - May decline the hepatitis B vaccination, but must sign a mandatory declination statement.

Post-Exposure Evaluation and Follow-up Procedures



- An exposure incident is a specific eye, mouth, mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials.
- Immediately following an exposure incident, personnel are required to receive confidential post exposure medical evaluation and follow-up.

Medical Evaluation



- The medical evaluation involves:
 - Evaluation of the incident, including documentation of the following:
 - Route of exposure
 - HBV and HIV status of source
 - Circumstances of the exposure
 - Collection and testing of exposed employee's blood for determination of HIV and HBV status
 - Collection and testing of source individual's blood if HIV and HBV status is not already known.

Follow-up



- Follow-up of the exposure incident includes:
 - Informing employee of results of all testing
 - Counseling
 - Post-exposure **prophylaxis** (e.g., administration of hepatitis B immune globulin) when medically indicated
 - Evaluation of any reported illness related to exposure incident
 - Offering additional HIV testing to the affected employee for six weeks after exposure and periodically thereafter.

Summary

- **Field personnel face on-the-job exposure to blood and other potentially infectious materials. This hazard can be reduced or removed by using a combination for the following:**
 - **Proper planning and training**
 - **Universal precautions**
 - **Engineering controls**
 - **Work practice controls**
 - **Personal protective clothing and equipment**
 - **Appropriate vaccinations.**

Summary

- **Key concepts presented in this module are:**
 - **On-the-job exposure**
 - **Conditions required for infectious disease transmission**
 - **Presence of bloodborne pathogens**
 - **Routes of exposure**
 - **Bloodborne diseases of concern: Hepatitis B, HIV/AIDS**
 - **Universal precautions**
 - **Engineering controls/work practice controls**
 - **Effective PPE**
 - **Decontamination of equipment and environmental surfaces.**

Summary

- Measures you can take to prevent infection include:
 - Understanding the modes of transmission
 - Becoming familiar with the Exposure Control Plan
 - Using universal precautions
 - Following safe work practice controls
 - Wearing appropriate PPE
 - Storing potentially infectious waste properly
 - If appropriate, receiving hepatitis B vaccination.

- You have completed the module:
- Bloodborne Pathogens