

4

Bloodborne Pathogens



TEACHING PLAN

To use this lesson for self-study, the learner should read the material, do the activity and take the test. For group study, the leader may give each learner a copy of the learning guide and follow this teaching plan to conduct the lesson.



LEARNING OBJECTIVES

Participants will be able to:

- Discuss harmful organisms that may be present in blood.
- Demonstrate precautions to prevent the spread of bloodborne diseases.
- Discuss procedures to follow after exposure to blood or body fluids.
- Understand the importance of vaccination against hepatitis B.



LESSON ACTIVITY

Write this matching quiz on a board or poster. Answer key follows.

1. Pathogens	a. There is no vaccine against it
2. Hepatitis B	b. These should be used with certain types of diseases
3. Hepatitis C	c. There is a vaccine against it
4. Standard precautions	d. This is the best way to prevent the spread of disease
5. Additional precautions	e. These are tiny organisms that can cause disease
6. Handwashing	f. These should be used at all times

Activity Answers:

1. e; 2. c; 3. a; 4. f; 5. b; 6. d

Ask a participant to draw one line matching an item in the left column with an item in the right column. Encourage the participant to ask others in the group for opinions if needed. Do the same thing with five other participants until all the lines have been drawn connecting the phrases.

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Hand out copies of the learning guide to participants. Lecture on the material in the guide, allowing for questions and discussion. Or ask participants to read portions of the guide and tell the rest of the group what they learned.

Discuss the pyramid chart until everyone understands it. You may want to post it on an employee bulletin board as a reminder of infection control precautions. If possible, demonstrate proper handwashing technique and have participants practice.

Look at your matching quiz on the board again. Ask participants if they need to change anything. Correct anything that was not matched to the right phrase.

Administer the test and grade it.



THE LESSON

Review the material in the learning guide with participants. Allow for discussion.



CONCLUSION

Have participants take the test. Review the answers together. Award certificates to those who answer at least seven (70%) of the test questions correctly.



TEST ANSWERS

1. HIV, HBV, HCV
2. True
3. three
4. True
5. False
6. False
7. True
8. 10-15
9. d
10. (1) handwashing; (2) gloves; (3) mask, eye protection, gown; (4) sharp items

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Why Is It Important to Protect Yourself From Contact With Blood and Body Fluids?

Though they can't be seen, there are hundreds of tiny organisms living in blood and other body fluids that can cause disease in humans. These are called "bloodborne pathogens."

Some of these organisms are harmless and can be handled easily by the body's immune system, but others can cause severe illness, such as hepatitis or AIDS.

Bloodborne Diseases: HIV/AIDS, Hepatitis B, Hepatitis C

Bloodborne pathogens include the hepatitis B virus (HBV), the hepatitis C virus (HCV), the human immunodeficiency virus (HIV) that causes autoimmune deficiency syndrome (AIDS) and others.

These pathogens are transmitted through contact with infected body fluids such as blood, semen and vaginal secretions. Exposures occur (a) when the skin is punctured by a contaminated needle, razor or other sharp item or (b) when broken skin or mucous membranes are splashed with blood or body fluid. Fortunately, most exposures do not result in infections.

Standard precautions are designed to prevent transmission of HIV, HBV and HCV. Standard precautions must be observed in all situations where there is potential for contact with blood or other potentially infectious body fluids.

Standard precautions apply to:

- Blood
- Semen
- Vaginal secretions
- Saliva
- Cerebrospinal fluid
- Synovial fluid
- Pleural fluid
- Peritoneal fluid
- Pericardial fluid

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- Amniotic fluid
- Feces
- Nasal secretions
- Sputum
- Sweat
- Tears
- Urine
- Vomitus

Treat all human blood and body fluids as if they are infectious. Remember who you are protecting—**YOURSELF!**

Proper handwashing procedure

1. Remove your watch if you are wearing one, or push it up your arm. You should not wear rings or bracelets at work.
2. Do not touch the sink with your hands while you are washing, and stand back from the sink to keep it from touching your clothes.
3. Use warm water. Hot water may dry out your skin.
4. Either bar soap or liquid soap is okay. If using a bar, rinse it first and hold it the whole time you are lathering. Soap does not have to be an antiseptic type, unless you are doing an invasive procedure such as catheterization.
5. Wet your wrists and hands.
6. Apply plenty of soap. Work up a thick lather all over your hands and wrists, between your fingers and thumbs, and on the back of your hands and wrists.
7. Vigorously rub all areas of your hands, fingers and wrists for a minimum of 10 to 15 seconds. Sixty seconds is better. Friction helps remove dirt and microorganisms.
8. Clean under your nails by using the nails on your other hand, or rub your nails into the palm of your other hand. Clean around the top of your nails.
9. Rinse with warm water, letting water run down from wrists to fingertips and into the sink.
10. Dry with a clean paper towel and throw it away.

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11. Turn off the faucet with a clean, dry paper towel and throw the towel away.
12. Use lotion on your hands to prevent irritation and chapping, which makes skin more prone to infection.

When handwashing facilities aren't available, use an agency-approved antiseptic hand cleaner or an antiseptic towelette. As soon as possible, rewash your hands with soap and water following the correct handwashing procedure.

Standard precaution 2: Gloves

- Use gloves in all situations where you may come in contact with blood or body fluids.
- Use gloves for patient care involving contact with mucous membranes, such as brushing teeth.
- Change gloves and wash hands between patient contacts.
- Use gloves when you have scrapes, scratches, or chapped skin.
- Do not wash or disinfect disposable gloves for reuse.

Standard precaution 3: Protective barriers

Protective barriers, including gloves, reduce the risk of your skin or mucous membranes being exposed to potentially infective blood and body fluids. You should wear the appropriate barriers for the work you are doing.

Employers must provide suitable personal protective equipment (PPE) in the right sizes. Protective equipment includes gloves, gowns, masks, eye protection, face shields, mouthpieces, resuscitation devices and other things. Hypoallergenic gloves, glove liners, powderless gloves or other alternatives must be available for those who are allergic to the regular gloves.

The equipment you need depends on your work. When splashing of blood or body fluids is likely, wear the following PPE in addition to gloves:

- Mask if your face could be splashed with blood or body fluids
- Eye protection if your eyes could be splashed with blood or body fluids
- Gown if your clothing or skin could be splashed

Standard precaution 4: Proper disposal of sharp items

A "sharp" is any object that can penetrate the skin, such as needles, scalpels, broken glass, broken capillary tubes and exposed ends of wires. A sharp is contaminated if it has been in contact with blood, body fluids or body tissues.

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Contaminated sharps must be disposed of properly. Follow your agency's policies.

- Be careful to prevent injuries from needlesticks and other sharp instruments after procedures, when cleaning used instruments and when disposing of used needles. Do not recap or manipulate needles.
- It's best to use needleless injection systems or needles with injury protection. If you must use a regular needle, remember:
 - Do not recap needles. If it is absolutely necessary to recap a needle, use one hand to slide the needle into a cap lying on a flat surface. Do not hold the cap in your other hand while recapping.

Tips

- Use thick rubber household gloves to protect your hands during housekeeping chores or instrument cleaning involving potential blood contact.
- Treat all linen soiled with blood or body secretions as potentially infectious.
- Surfaces that have been contaminated with blood or body fluids should be cleaned with a disinfectant according to your organization's policies.

If an Exposure Occurs

Immediately following an exposure to blood or body fluids:

- Wash needlesticks and cuts with soap and water.
- Flush splashes to the nose, mouth or skin with water.
- Irrigate eyes with clean water, saline or sterile irrigants.

Next:

- Report the exposure at once. Treatment may be recommended, and it should be started as soon as possible. See a medical professional.
- Discuss the possible risks and the need for treatment with the person managing your exposure.
- Remember that mandatory testing of a patient is not legal. Patients who might be the source of an infection must give consent to be tested.

Workers' Rights

The Occupational Safety and Health Administration (OSHA) is a federal agency that guarantees rights to a safe workplace. Under OSHA's rules, workers who might be exposed to contaminated blood or body fluids have specific rights.

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Employers must train workers that might be exposed to blood or body fluids about the hazards and how to protect themselves. This training must occur during working hours at no cost to employees, at orientation and annually thereafter.

Standard precautions must be practiced at all times. Punctureproof and leakproof containers must be provided for disposal of sharp items. There must be a system for reporting exposures to blood or body fluids.

Employers must provide free hepatitis B vaccination, free protective equipment and free immediate medical evaluation and follow-up for anyone exposed to blood or body fluids. Employees must receive confidential treatment, and their medical records must be protected.

Workers' responsibilities

- Always use standard precautions.
- Actively participate in evaluating safer equipment and encouraging your organization to purchase safer equipment. Be open to new products or practices that could prevent exposure and protect workers and patients.
- Be immunized against hepatitis B, getting the series of three injections.
- Report all exposures immediately after cleaning and disinfecting the exposed skin or mucous membranes.
- Comply with postexposure recommendations of your organization.
- Support other workers who have been exposed. HIV-infected workers who continue working deserve support and confidentiality.
- Know your own HIV/HBV/HCV status. If you are positive for any of these viruses, you do not pose a risk for patients if you don't do invasive procedures.

Specific Exposure Risks and Treatments

Human immunodeficiency virus

HIV is the virus that causes AIDS.

Risk of infection after exposure:

- Needlestick is the most common cause of work-related infection.
- Risk factors include the amount of blood or fluid, the puncture depth and the disease stage of the infected person.

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- The average risk of HIV infection after a needlestick or cut exposure is 1 in 300. The risk after exposure of the eye, nose, skin or mouth to positive blood is less than 1 in 1,000. If the skin is damaged, the risk may be higher.

Treatment after exposure:

- There is no vaccine against HIV.
- Postexposure treatment is not always recommended. A physician or exposure expert should advise you.
- Drugs used to prevent infection may have serious side effects.
- Perform HIV antibody testing for at least six months after exposure.

Hepatitis B virus

Risk of infection after exposure:

- Hepatitis B vaccine prevents this disease. Persons who have received the vaccine and developed immunity are at virtually no risk for infection. A series of three injections are required, given initially, then one to two months later, then four to six months after the first injection.
- Workers should be tested one to two months after the vaccination series to make sure the vaccination has provided immunity.
- For the unvaccinated person, the risk from a single needlestick or cut exposure ranges from 6% to 30%, depending on the level of virus in the infected person's blood. A higher concentration of virus makes it more likely that someone exposed to that blood will become infected.

Treatment after exposure:

- Everyone with a chance of exposure to blood or body fluids should receive hepatitis B vaccine, preferably during training, unless it is contraindicated because of allergies, pregnancy or potential pregnancy.
- Hepatitis B immune globulin (HBIG) effectively prevents HBV infection after exposure. Recommendations for postexposure management of HBV may include HBIG and/or hepatitis B vaccine. The decision to begin treatment is based on several factors, such as whether the:
 - Source person is positive for hepatitis B
 - Worker has been vaccinated
 - Vaccine provided immunity

Hepatitis C virus

Infection with HCV carries a great potential for chronic liver disease and can lead to liver failure, liver transplants and liver cancer.

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Risk of infection after exposure:

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

Treatment after exposure:

- There is no vaccine against hepatitis C and no treatment after an exposure that will prevent infection.
- HBIG is not recommended.
- Following recommended infection control practices is vital.
- There are several tests that should be performed in the weeks after an exposure and for four to six months afterward. Confer with a physician or an exposure specialist.

Additional Precautions for Infection Control

If you know or suspect that a patient has a disease that is spread in one of the following ways, use the following extra precautions in addition to standard precautions.

Airborne germs can travel long distances through the air and are breathed in by people. Examples of diseases caused by airborne germs are TB, chickenpox and shingles. Precautions include the following:

- Wear a mask. If the patient has, or might have, TB, wear a special respiratory mask (ask your supervisor). A regular mask will not protect you.
- Remind the patient to cover nose and mouth when coughing or sneezing.
- Treat the patient's used tissues or handkerchiefs as infected material.

Contact germs can cause the spread of disease by touch. Examples of diseases caused by contact germs are pink eye, scabies, wound infections and methicillin-resistant *Staphylococcus aureus*. Precautions include the following:

- Wear gloves.
- Treat bed linens, clothes and wound dressings as infected material.
- Wear a gown if the patient has drainage, has diarrhea or is incontinent.
- Use a disinfectant to clean stethoscopes, blood pressure cuffs or other equipment.

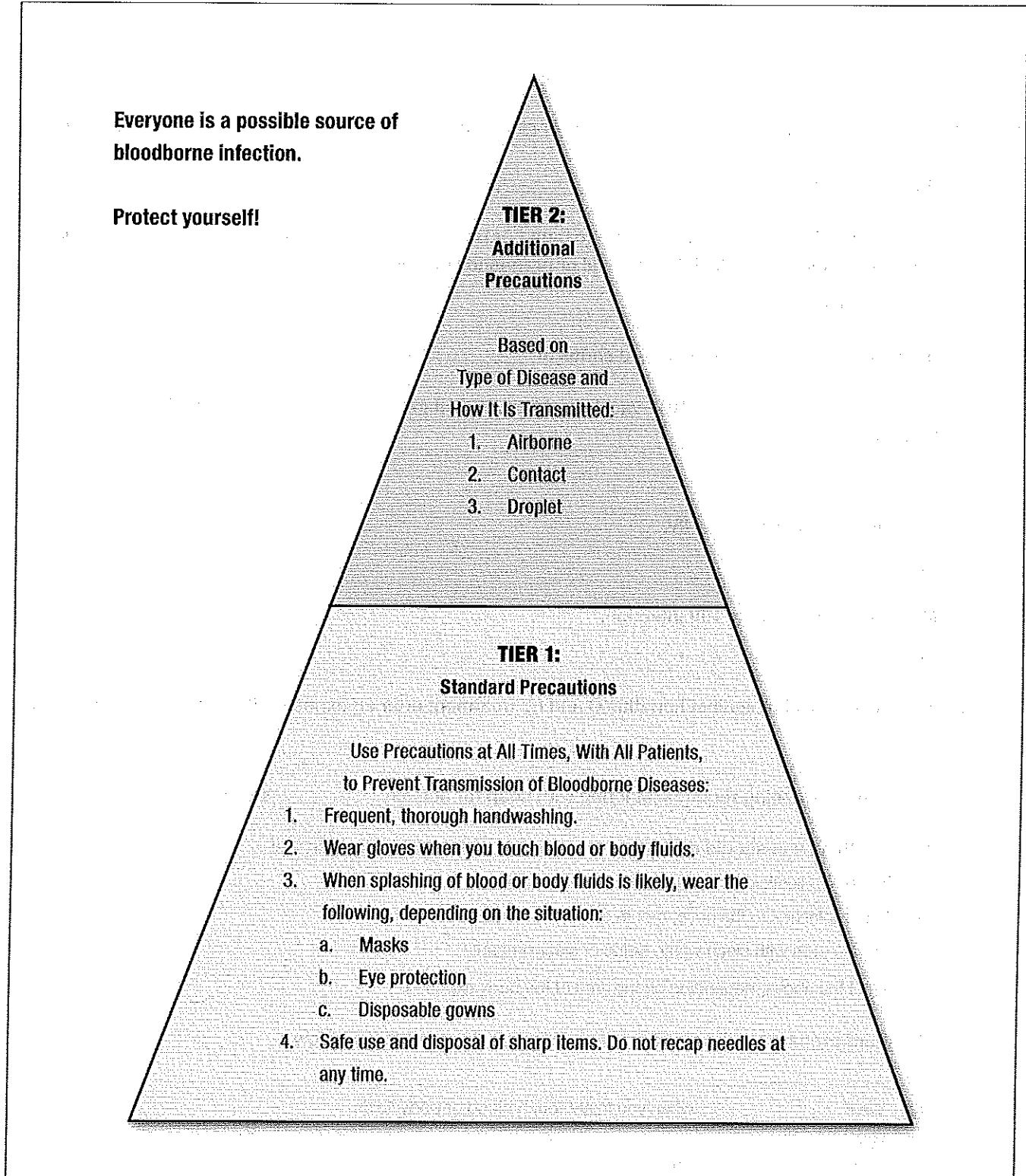
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Droplet germs can travel short distances through the air, usually not more than 3 feet. Sneezing, coughing and talking can spread these germs. Examples of diseases caused by droplet germs are flu and pneumonia. Precautions include the following:

- Wear a mask when working close to the patient (within 3 feet).

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FIGURE 4.1 | CENTERS FOR DISEASE CONTROL AND PREVENTION TWO-TIERED SYSTEM TO CONTROL DISEASE TRANSMISSION



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TEST

Bloodborne Pathogens and Standard Precautions

Name _____ Date _____ Score _____

Directions: Fill in the blank with the correct answer, or circle the correct answer. (Seven correct answers required.)

1. Name three bloodborne pathogens: _____, _____, _____.
2. All workers with a chance of exposure to blood or body fluids should receive the hepatitis B vaccine unless they shouldn't take it for medical or pregnancy reasons.
True or False
3. Hepatitis B immunization requires a series of _____ injections.
4. Persons who have received HBV vaccine and developed immunity are at virtually no risk for infection for hepatitis B.
True or False
5. There is a vaccine against HIV.
True or False
6. Most exposures lead to HIV infection.
True or False
7. There is no vaccine against hepatitis C and no treatment after an exposure that will prevent infection.
True or False
8. Proper hand washing requires lathering with soap for at least _____ seconds.
9. The first thing you should do if you are exposed to blood or body fluids is:
 - a. Wash needlesticks and cuts with soap and water.
 - b. Flush splashes to the nose, mouth or skin with water.
 - c. Irrigate eyes with clean water, saline or sterile irrigants.
 - d. All of the above, depending on the area of the body exposed.
10. Standard precautions involve four basic things. Fill in the blanks below.
 - (1) _____.
 - (2) Wear _____ when you might touch blood or body fluids.
 - (3) Wear _____, _____ or _____ when splashing of blood or body fluids is likely, depending on the situation.
 - (4) Safely use and dispose of _____.