Bloodborne Pathogens Training

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Objectives

- Identify the different bloodborne pathogens, their symptoms, and how they are spread
- Identify occupations and activities with high risks of exposure
- Discuss how to reduce your risk of exposure to blood and other potentially infectious materials (OPIM)
- Discuss how to clean up and decontaminate work areas, equipment, and supplies
- Identify regulated wastes and how to label and dispose of them
- Discuss what to do if you are exposed to blood or OPIM
- Discuss the Hepatitis B vaccine
- Review your employer's Exposure Control Plan (ECP)

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What are Bloodborne Pathogens?

- Diseases that are passed from person-to-person through blood and other potentially infectious materials (OPIM)
  - OPIM includes other human body fluids containing blood, human tissue or organs, and cultures containing bloodborne pathogens
  - Urine, feces, tears, nasal secretions (mucus), sputum, and vomit are **NOT** considered OPIMs, but they can transmit other diseases

- Three primary bloodborne pathogens:
  - Human Immunodeficiency Virus (HIV)
  - Hepatitis B (HBV)
  - Hepatitis C (HCV)

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HIV

- Virus that attacks the body's immune system and reduces the number of T cells that fight infections
  - Cannot fight off other infections and diseases
  - Can lead to Acquired Immunodeficiency Syndrome (AIDS)
  - 2012: 1.2 million people age 13 and older living with HIV in the United States (estimated)
- No effective cure, but can be controlled through daily treatments
- Average risk of HIV infection:
  - After needlestick or cut exposure: 0.3% (about 1 in 300)
  - After exposure of the eye, nose, or mouth: 0.1% (1 in 1,000)
  - After exposure of skin: <0.1% (<1 in 1,000)

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HIV: How It's Spread

- Highest Risk:
  - Sex
  - Needle sharing
- Less Common:
  - Mother to child during pregnancy, birth, or breastfeeding
  - **Needlestick from an HIV-contaminated needle or other sharp object**
- Extremely Rare:
  - Oral sex
  - Blood transfusions and organ/tissue donations
  - Eating food pre-chewed by an HIV-infected person (infants)
  - Bitten by a person with HIV
  - **Contact between broken skin, wounds, or mucous membranes and HIV-infected blood or OPIM**
  - Deep, open-mouth kissing if both partners have sores or bleeding gums

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HIV: Signs and Symptoms

- Some people have flu-like symptoms 2-4 weeks after infection
  - Fever
  - Chills
  - Rash
  - Night sweats
  - Muscle aches
  - Sore throat
  - Fatigue
  - Swollen lymph nodes
  - Mouth ulcers
- Can last a few days to several weeks
- May not show up on a HIV test yet

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Hepatitis B

- Contagious liver disease caused by a virus that can last a few weeks (acute) or a lifetime (chronic)
  - Rate of acute infection leading to chronic infection is about 6-10%
  - Can lead to liver damage, cirrhosis, and liver cancer
  - Vaccine is available
  - 2014: 19,200 new cases in the United States (estimated)
- No medication available for acute HBV, but some medications may be available for chronic HBV
- Average risk of HBV infection after needlestick or cut exposure: 6-30%
- Can live outside the body for up to 7 days

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Hepatitis B: How It's Spread

- Birth (infected mother to baby)
- Sex
- Sharing needles, syringes, or other drug-injection equipment
- Sharing items such as razors or toothbrushes
- **Direct contact with blood or open sores**
- **Exposure to blood from needlesticks or other sharp instruments**

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Hepatitis B: Signs and Symptoms

- Symptoms can appear anytime between six weeks and six months (90 day average)
  - Fever
  - Fatigue
  - Loss of appetite
  - Nausea
  - Vomiting
  - Abdominal pain
  - Dar urine
  - Clay-colored bowel movements
  - Joint pain
  - Jaundice (yellow color to skin and/or eyes)

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Hepatitis C

- Contagious liver disease caused by a virus that can last a few weeks (acute) or a lifetime (chronic)
  - Rate of acute infection in adults leading to chronic infection is about 75-85%
  - Can lead to cirrhosis and liver cancer
  - 2014: 30,500 cases of acute HCV and 2.7-3.9 million cases of chronic HCV in people in the United States (estimated)
- Treatment is available for both acute and chronic HCV
  - Acute treatment helps reduce the risk of infection becoming chronic
  - 15-25% of people with HCV will clear the virus without treatment
- Average risk of HCV infection after needlestick or cut exposure: 1.8%
- Can live outside the body for up to 3 weeks

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Hepatitis C: How It's Spread

- Increased risk:
  - Sharing needles, syringes, or other equipment to inject drugs
  - Tattooing and piercing with non-sterile equipment
  - **Needlestick injuries**
  - Being born to a mother who has HCV
- Less common:
  - Sharing personal care items like razors and toothbrushes
  - Sex
- Extremely rare:
  - Donated blood, blood products, and organs

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Hepatitis C: Signs and Symptoms

- Symptoms can occur two weeks to six months after exposure (average 6-7 weeks)
  - Fever
  - Fatigue
  - Loss of appetite
  - Nausea
  - Vomiting
  - Abdominal pain
  - Dark urine
  - Clay-colored bowel movements
  - Joint pain
  - Jaundice (yellow color skin and/or eyes)
- 70-80% of people with acute HCV do not have symptoms

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Exposure Control Plan (ECP)

- Created specifically for a business or facility to minimize or eliminate their employees' occupational exposure to bloodborne pathogens
- Must be a written plan that is:
  - Reviewed annually
  - Updated to reflect any changes to safer work practices
  - Developed with input from potentially exposed employees
  - Made available to employees
- Must be reviewed with new employees soon after employment and with all employees annually
- Employees covered by the ECP are expected to comply with the policies and procedures in the plan

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Exposure Control Plan (ECP)

- An exposure control plan (ECP) includes:
  - Determination of an employee exposure
  - Implementation of various methods of exposure control, including universal precautions, engineering and work practice controls, personal protective equipment (PPE), and housekeeping
  - Hepatitis B vaccination
  - Post-exposure evaluation and follow-up
  - Communication of hazards to employees and training
  - Recordkeeping
  - Procedures for evaluating circumstances surrounding exposure incidences

(OSHA, 2003, Model Plans and Programs for the OSHA Bloodborne Pathogens and Hazard Communications Standards)

Occupational Exposure

- All workers who may come into contact with blood or OPIM as part of the performance of their job duties have occupational exposure

- Higher risk occupations:
  - Health care workers
  - Correctional health care workers
  - First responders and emergency response personnel
  - Tattooists and piercers
  - Maintenance and custodial workers in health care facilities
  - Waste haulers, recycling plant workers, and **sewage treatment workers**

Risks for Wastewater Workers

- Centers for Disease Control and Prevention (CDC):
  - "…Sewage treatment workers can experience needlestick injuries when used needles are improperly disposed of." (CDC, 2016, Bloodborne Infection Diseases: Safe Community Needle Disposal)

- Occupational Safety and Health Administration (OSHA):
  - **DOES NOT** consider contact with wastewater and raw sewage to be occupational exposure to bloodborne pathogens **UNLESS** it comes from a health care facility or other source of bulk blood or OPIM
    - Urine, feces, and other human wastes in sewage are not considered OPIM unless "visibly contaminated with blood"
  - **DOES** recognize that exposure to wastewater and sewage poses other health risks (OSHA, 2007, Standard Interpretations)

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Exposure Risks

- **Needlesticks from used syringes or needles when cleaning out drains**
- **Giving first aid to another employee (e.g. bandaging a cut)**
- Blood or OPIM coming into contact with mucous membranes (e.g. eyes, nose, mouth) or broken (e.g. cut) skin
  - Splashed in the mouth with contaminated wastewater
  - Blood sprayed in the eye from a coworker's injury
  - Cut on a pipe and open wound is exposed to contaminated wastewater
  - Cleaning up equipment (e.g. work stations, floors, clothing) or throwing away supplies (e.g. paper towels, bandages, tissues) contaminated with blood or OPIM when not wearing proper personal protective equipment (PPE)

Reducing Your Risk

- **Follow your employer's Exposure Control Plan**
- Treat all blood and OPIM as if it is already infected
- Wear personal protective equipment (PPE)
- Follow safe work practices
- Clean up and decontaminate after an exposure
- Seek immediate medical care after exposure
- Complete all follow-up care after exposure
- Get the Hepatitis B vaccine

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Using Personal Protective Equipment

- Create a barrier between you and any blood or OPIM
- Wash hands in hot, soapy water for at least 20 seconds **BEFORE** putting on PPE and **AFTER** taking off and disposing of PPE
- Gloves
  - Non-porous material like latex or vinyl that fit properly
  - Only use once
  - Wear when providing first aid to another employee, when cleaning up blood or OPIM after an incident, or when it is likely you will come into contact with blood or OPIM

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Using Personal Protective Equipment

- Eyewear
  - Goggles or face shields can protect from blood or OPIM splashes or sprays
  - Should fully protect the eyes - contact lenses and eyeglasses are not adequate

- Masks
  - Protects from blood or OPIM splashes or sprays in the mouth and nose
  - Should fit securely across the nose and mouth

Follow Safe Work Practices

- Remove used PPE before leaving the work area where an incident occurred
- Do not eat, drink, or use other personal items in any work areas where there is a possibility of exposure to blood or OPIM
- Do not place or store food in any work areas where it may be exposed to blood or OPIM

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Clean Up and Decontamination

- Wash your hands
- Wear appropriate PPE (e.g. gloves, eyewear)
- Use mechanical means to pick up sharp objects and immediately dispose of in a hard-plastic (e.g. laundry detergent bottle) or FDA-cleared sharps container
  - Pick up with tongs
  - Sweep up with a broom and dustpan

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Clean Up and Decontamination

- Use absorbent paper towels to soak up blood or OPIM
- Use an EPA-registered disinfectant or diluted bleach solution (10:1 water to bleach) as instructed on the container to wipe down all surfaces and equipment
  - Do not put contaminated towels in the container of disinfectant solution
  - Use a new towel when an old one is too soiled to continue use
- Immediately dispose of contaminated supplies in their appropriate container

Waste Disposal

- Waste that does not meet the definition of regulated waste can be thrown away with other trash

- Regulated wastes includes:
  - Liquid or semi-liquid blood or OPIM
  - Contaminated items that could release blood or OPIM in liquid or semi-liquid form if squeezed or compressed
  - Items caked in dried blood or OPIM that can be released from materials during handling
  - Contaminated sharps (e.g. syringes, needles, broken glass or metal)
  - Pathological or microbiological wastes containing blood or OPIM

Waste Disposal

- Regulated wastes must be disposed of in labeled biohazard containers
  - Labels must say “Biohazard” and be fluorescent orange or orange-red
  - Labels must be affixed to the container (e.g. sticker)
  - Red bags or red containers can be substituted for labels
  - Bags and containers must be entirely sealable
  - Sharps should be placed in a hard-plastic container to avoid punctures
- Any clothing that needs to be laundered that meets the definition of regulated waste should be placed in a labeled biohazard container before cleaning

Biohazard Labels and Containers

Source: Environmental Health and Safety – University of Virginia

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Source: EPA - Illinois

Source: Biological Sciences Department – Cal Poly

Post-Exposure Care

- Immediately wash and/or rinse exposed area
  - Skin: wash with soap and water for 20 seconds
  - Eyes: flush with water or saline
  - Nose and mouth: flush with water
- Report the exposure to appropriate personnel (e.g. supervisor)
  - How were you exposed (e.g. cut, needlestick)?
  - Where were you exposed (e.g. hand, arm, face)?
  - What were you doing to result in exposure (e.g. cleaning a pipe)?
  - Who is the source of the exposure (e.g. coworker)?
- Go to employer-designated healthcare provider within 24 hours to 7 days
  - Post-exposure care and counseling must be provided at no cost

Post-Exposure Follow-Up

- Employer must identify and document the source individual, if known
- Employer must send source individual and exposed individual for blood testing
  - Consent must be obtained; if consent is denied, employer must document the denial
- Employer will provide information to the healthcare provider:
  - Description of the employee's duties as they related to the exposure incident
  - Documentation of the route(s) and circumstances of exposure
  - Results of the source individual's blood testing
  - All medical records relevant to the appropriate treatment of the exposed employee

Post-Exposure Follow-Up

- Employee must receive post-exposure counseling on infection status, risk of infection, and making decisions to protect personal contacts

- Employer must provide the exposed employee with a copy of the post-exposure evaluation from the healthcare provider
  - Written opinion must include that the employee has been informed of the results of the evaluation and told about any medical conditions resulting from exposure that may require further evaluation and treatment
  - All other findings or diagnoses must be kept confidential and **NOT** included in the written report

- Employer must keep a log of occupational injuries and illnesses

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Get the Hepatitis B (HBV) Vaccine

- HBV vaccine can reduce risk of infection to virtually zero
- Three shots over a six month period
  - After receiving all three doses, >90% protection for adults
- Only need the vaccine series once in your lifetime
- Provided by employers at no cost to all workers who have occupational exposure
- Workers declining the vaccine must sign a declination form
  - You may change your mind at any time and request the vaccine
- For more information, call our Public Health Nursing Division at (317) 745-9222

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Questions?

References

- https://www.osha.gov/SLTC/bloodbornepathogens/recognition.html
- https://www.tdcj.state.tx.us/documents/Bloodborne_Pathogen_Program.pdf
- http://www.cdc.gov/hiv/
- https://www.cdc.gov/oralhealth/infectioncontrol/faq/bloodborne_exposures.htm
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- http://www.cdc.gov/niosh/topics/bbp/
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Reducing Health Risks

Workers Handling Human Waste or Sewage

Diseases Involving Sewage

- Balantidium coli (*B. coli*)
- Campylobacteriosis
- Cholera
- Cryptosporidiosis
- Escherichia coli (*E. coli*)
- Encephalitis
- Entamoeba histolitica (*E. histolytica*)
- Gastroenteritis
- Giardiasis
- Hepatitis A
- Leptospirosis
- Methaemoglobinaemia
- Norwalk-type virus
- Poliomyelitis
- Rotavirus
- Salmonellosis
- Shigellosis
- Paratyphoid fever
- Typhoid fever
- Yersiniosis

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Basic Hygiene Practices

- Wash hands with soap and water immediately after handling human waste or sewage
- Avoid touching face, mouth, eyes, nose, or open sores and cuts while handling human waste or sewage
- After handling human waste or sewage, wash your hands with soap and water *before* eating or drinking
- After handling human waste or sewage, wash your hands with soap and water *before* and *after* using the toilet

(CDC, 2015 Guidance for Reducing Health Risks to Workers Handling Human Waste or Sewage)

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Basic Hygiene Practices

- Before eating, removed soiled work clothes and eat in designated areas away from human waste and sewage-handling activities
- Do **not** smoke or chew tobacco or gum while handling human waste or sewage
- Keep open sores, cuts, and wounds covered with clean, dry bandages
- Gently flush eyes with safe water if human waste or sewage contacts eyes

(CDC, 2015 Guidance for Reducing Health Risks to Workers Handling Human Waste or Sewage)

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Basic Hygiene Practices

- Use waterproof gloves to prevent cuts and contact with human waste or sewage
- Wear rubber boots at the worksite and during transport of human waste or sewage
- Remove rubber boots and work clothes before leaving worksite
- Clean contaminated work clothing daily with 0.05% chlorine solution (1 part household bleach to 100 parts water)

(CDC, 2015 Guidance for Reducing Health Risks to Workers Handling Human Waste or Sewage)

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Personal Protective Equipment (PPE)

- Goggles
- Protective Face Mask or Splash-Proof Face Shield
- Liquid-Repellent Coveralls
- Waterproof Gloves
- Rubber Boots

(CDC, 2015 Guidance for Reducing Health Risks to Workers Handling Human Waste or Sewage)

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When to Seek Medical Care

- Immediately after showing signs or symptoms of waterborne disease:
  - Diarrhea
  - Loose, watery stools
  - Abdominal cramping or pain
  - Loss of appetite
  - Nausea
  - Vomiting
  - Fever
  - Fatigue
  - Jaundice (yellowing of skin and/or eyes)
  - Body aches and pains
  - Headache

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Vaccination Recommendations

- Tetanus (Tdap)
- Hepatitis B
- Hepatitis A
- For more information, call our Public Health Nursing Division at (317) 745-9222

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References

1. http://www.in.gov/isdh/22963.htm

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3. http://www.cdc.gov/niosh/docs/2002-149/pdfs/2002-149.pdf

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Exposure Control Plan

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