Blood Borne Pathogens / Infection Control
2024

Prevention and Containment of Communicable Disease

In 1991, OSHA issued final regulations on job exposure to blood-borne pathogens – the bacteria and viruses present in human blood and body fluids that can cause disease in humans. These pathogens include hepatitis B virus, HIV virus and hepatitis C virus. OSHA concluded that employers can reduce or remove hazards from the workplace by using a combination of engineering and work practice controls, personal protective clothing and equipment, training, medical surveillance, hepatitis B vaccination, signs and labels and other provisions.

This section will describe the prevention and containment of disease and conditions that staff may encounter in a group home.

Prevention and Containment of Communicable Disease Learning Objectives

- Understand how infection occurs.
- Recognize the pathogens that cause diseases. Understand how diseases are spread.
- Recognize the signs and symptoms, mode of transmission and infective material for diseases that cause concern. Understand how to protect self from disease transmission.
- Understand the steps to follow if an exposure occurs.

How Infections Occur

The disease begins when an infectious agent gets into the body. When pathogens enter the body, they can sometimes overpower the body's defense system and cause illness. This illness is an infection. Most infections are caused by one of five types of pathogens. These are listed in the chart below:

Pathogen	**Diseases and Conditions They Cause**
Viruses	Hepatitis, Measles, Mumps, Rubella, Varicella-Zoster (Chicken Pox & Shingles), Viral Meningitis, Influenza, HPV (Genital Warts), Rhinoviruses (Common Cold), HSV 1 & 2 (Herpes), HIV infection (AIDS)
Bacteria	Tetanus, Diphtheria, Bordetella pertussis, Bacterial Meningitis, group A strep (scarlet fever & strep throat), Tuberculosis, Legionella (Legionnaires Disease Pontiac Fever), Gonorrhea, Syphilis, Chlamydia, Rickettsia Bacteria (Typhus & Rocky Mountain Spotted Fever, transmitted by ticks/fleas) Food Poisoning and Toxic Shock Syndrome (Caused by multitudes of Bacteria)
Fungal	Ringworm (more commonly called Athlete's foot)
Protozoan	Malaria (transmitted by mosquitos), Amebic Dysentery (E. histolytica)
Helminth (Worms)	Ascaris lumbricoides, Hookworm, Whipworm, Nematodes abdominal pain, anemia, lymphatic vessel blockage, lowered antibody response, respiratory and circulatory complications

How Diseases Spread

For a disease to be transmitted, the infectious agent leaves its **reservoir** (host) through a **portal of exit,** conveyed by some **mode of transmission,** and enters through an appropriate **portal of entry** to infect a **susceptible host**. If one or more of these conditions are missing, a disease cannot be transmitted.

Mode of Transmission:

Direct contact: Skin to Skin contact, exchanging or touching body fluids, direct contact with soil/vegetation harboring infectious organisms.

Droplet Spread: "Spray" with relatively large, short-range aerosols produced by sneezing, coughing, or

even talking. Considered a type of Direct contact because transmission is by direct spray over a few feet, before the droplets fall onto a surface. (Pertussis and Meningococcal).

Indirect contact: transfer of an infectious agent from a reservoir to a host by suspended Air particles, inanimate objects or animate intermediaries (vectors).

Airborne: Breathing in droplets/dust suspended in air from an infected person coughing/sneezing. Compared to Droplet Spread, the droplet nuclei for airborne agents may remain suspended in the air for long periods of time and may be blown over great distances. (Measles and Tuberculosis)

Vehicles that may indirectly transmit an infectious agent includes food, water, biological products (blood, stool), and inanimate objects (tissues, bedding, sharps). Can passively carry an agent (Hep A in food/water) or be an environment that an agent grows (improperly canned foods).

Vectorborne: Agents transmitted by mosquitoes, fleas, ticks, rats. Vectors may carry an agent through purely mechanical means or may support growth or changes in the agent. (Shigella on the appendages of Flies or Malaria matures in mosquitoes before being transmitted to humans).

Diseases That Cause Concern

Some diseases, such as the common cold, are passed from one person to another more easily than others. The common cold is short-lived and rarely serious. Other diseases cause more severe problems and can last for months or even cause death. Following are diseases that can have serious consequences if transmitted.

Disease	Signs and Symptoms	Mode of Transmission	Infective Material
Herpes	Oral or Genital sores/fever blisters, Broken Blisters leave painful sores, Flu-like symptoms (Fever, body aches, swollen glands)	Direct contact	Broken Skin, Mucus Membrane Contact
Meningitis	Bacterial: Fever, Headache, Stiff Neck, Nausea, Vomiting, Altered Mental Status, Photophobia. (More Severe) Viral: Fever, Irritability, Poor Appetite, Difficult to wake up, Lethargy (Less Severe)	Airborne Direct/Indirect Contact	Food, Water, Mucus Membrane Contact (Depends on Type of Infection)
Tuberculosis	Bad cough that lasts 3 weeks or longer, Chest Pain, Coughing up blood/sputum, Weakness/Fatigue, Wight Loss, No appetite, Chills/Fever, Night Sweats	Airborne	Airborne Droplets
Hepatitis A, B, C	Fatigue, Body Pain, GI problems (Vomiting/Diarrhea), Fever, poor appetite, Yellowing skin/eyes, dark urine, clay-colored stool	Direct/Indirect Contact	Blood, Saliva, Vaginal Fluids, Semen, Stool, Contaminated Food and Water
HIV	Some may have symptoms 2-4 weeks after infection: Fever/Chills, Night Sweats, Rash, Muscle Aches, Sore Throat, Fatigue, Mouth Ulcers, Swollen Lymph Nodes. **Some may not feel sick during acute HIV (Stage 1)**. AIDS (Stage 3) can have symptoms of the opportunistic infections that are easily transmitted to the infected individual.	Direct/Indirect Contact	Blood, Semen, Vaginal fluid, Rectal Fluids, Breast Milk.

Blood Borne Pathogens

Blood borne pathogens are pathogenic microorganisms that are present in human blood and can cause disease in humans. Hepatitis B virus (HBV) and Human immunodeficiency virus (HIV) are two examples of blood borne pathogens.

Fluids in which blood borne pathogens may be present are blood, semen, vaginal secretions, oral secretions, sputum, vomitus, wound discharge, urine, stool or any bodily fluid that is visibly contaminated with blood. Any sharp object can potentially be contaminated with infectious materials.

The use of protective barriers, such as gloves, gowns, aprons, masks, or protective eyewear, can reduce the risk of exposure to potentially infective materials to skin or mucous membranes. It is recommended that all staff take precautions to prevent injuries caused by needles.

Protecting Yourself From Disease Transmission

Read and be familiar with the Exposure Control Plan. Employees must be provided with information and training regarding hazards of disease transmission, signs and symptoms, medical surveillance and therapy, site-specific protocols including the use of engineering controls.

Immunizations. The following immunizations are recommended: Diphtheria, Pertussis, Tetanus (DPT), Polio, Hepatitis B, Measles, Mumps, Rubella, (MMR), Influenza, Covid-19.

Precautions. "Universal Precautions" are a set of precautions taken to prevent occupational-risk exposure to transmission of HIV, Hepatitis B, and other blood borne pathogens. Blood and body fluids containing **visible** blood, semen, and vaginal secretions should be treated as if they are infected with HIV, Hepatitis B, and other blood borne pathogens. "Universal Precautions" do not apply to feces, nasal secretions, sputum, sweat, tears, urine, and vomitus except when they contain **visible** blood. "Body Substance Isolation" emphasizes avoiding contact with **all** moist and potentially infectious body substances except sweat by using Personal Protective Equipment.

Regardless of the type of exposure risk, basic precautions and safe practices must be followed each time care is provided. The following four areas must be followed:

Handwashing: Hand washing is the single most important measure for preventing the spread of infection.

* Wash Hands:
  - After handling contaminated articles.
  - Before and after doing invasive procedures and dressing changes.
  - After performing personal bodily functions or assisting others with personal bodily functions.
  - Before and after gloves are removed.
* How to Wash Hands:
  - Use soap and warm running water.
  - All skin surfaces up to the wrists are included.
  - Wash hands for a minimum of 15 - 20 seconds.
  - Rinse hands thoroughly under running water.
  - Dry hands with a paper towel.
  - Turn off water with a different, dry, paper towel.

Personal Protective Equipment includes all equipment and supplies that keep you from direct contact with infected materials. These include gloves, gowns, masks and face shields, protective eyewear, and resuscitation devices. To minimize your risk of exposure, follow these guidelines when using protective equipment:

- Wear disposable gloves when it is possible you will contact blood or body fluids either directly or indirectly.
- Remove gloves properly. Never touch the soiled surface. Discard gloves that are discolored, torn or punctured. Never reuse gloves. Gloves are for single use only.
- Avoid handling items such as pens, keys, doorknobs when wearing soiled gloves.
- Change gloves between recipients.
- Cover cuts, scrapes, or skin irritation with band aids before putting on gloves.
- Use a breathing device if you have to give rescue breaths.
- Wash your hands after removing gloves.

Engineering and work practice controls: controls by the employer that isolate or remove the hazard from the workplace. This includes things such as puncture resistant containers for sharps and mechanical needle recapping devices. Work practice controls are based on the way an employer and employee behave than on a physical device. Work practice controls include:

- Avoiding needle stick injuries by not trying to bed or recap needles.
- Placing sharp items in a puncture proof container.
- Cleaning and disinfecting all equipment possibly soiled by blood or other body fluids.
- Washing hands thoroughly with soap and water.
- Having handwashing facilities accessible.
- Providing antiseptic towelettes or hand cleanser where handwashing facilities are not available.
- Avoiding eating, drinking, smoking or touching mouth, eyes or nose in work areas where an exposure may occur.

Cleaning and disinfecting: Clean and disinfect equipment to prevent exposure to infectious pathogens. Use labeled containers for items contaminated with blood. Keep work area clean and sanitary. Follow the written cleaning schedule. Review the plan that describes the steps to take if a spill containing blood or other body fluids should occur.

If An Exposure Occurs

An “exposure incident” is defined as an eye, mouth, other mucous membrane, non-Intact skin or contact with other potentially infectious material resulting from performance of an employee’s job duties. If you think that you have been exposed to an infectious disease, wash any area of contact as quickly as possible then complete an incident report. Write what happened that led to the exposure, describe the exposure and what you did after the exposure. Notify your supervisor/home manager immediately. You should receive a medical evaluation, counseling and post-exposure care.

SARS-CoV-2 / COVID-19

Cause/Etiology

A severe acute easily spread viral illness of the respiratory tract.

Transmission

The virus is easily transmitted from person to person by direct deposition of virus laden large droplets onto the mucosal surfaces of the upper respiratory tract of a person during close contact with an infected person as well as by droplet nuclei or small particle aerosols. This occurs during coughing, sneezing, talking, etc. when susceptible persons are in close proximity to the infected person. The virus may live for hours in dried mucous and on environmental surfaces. (i.e: telephone, doorknobs, etc.) This is why hand washing is imperative in preventing the spread of the illness. Key in prevention however is social distancing and wearing a mask.

Signs & Symptoms

COVID-19 has a wide range of symptoms reported- ranging from mild symptoms to severe illness. Symptoms may appear 2-14 days after exposure to the virus. Abrupt fever, usually above 100.0 degrees and respiratory signs: cough, shortness of breath or difficulty breathing, congestion or runny nose, sore throat. Other symptoms are fatigue, muscle or body aches, headache, new loss of taste or smell, nausea, vomiting, and diarrhea. Seek emergency medical attention with trouble breathing, persistent pain or pressure in the chest, new confusion, inability to wake or stay awake, bluish lips or face.

Treatment

Treatment is case by case basis and is dependent on disease severity and need for supplemental oxygen. Physicians can prescribe antiviral medication and/or a corticosteroid as they deem necessary. However, as with any medication, these too have unwanted side effects that may make it impracticable to use with some persons. Treatment guidelines are changing frequently the more we learn and understand about this disease.

Prevention

Currently the best prevention is wearing a mask, stay at least 6 feet (about 2 arm lengths) from others who don't live with you, and avoid crowds. Hand washing is the number one defense in the fight against any infection and one of the key elements of preventing the spread of COVID-19. Use soap and water when at all possible. Use hand sanitizer if soap and water aren't available. If you are sick stay at home except to get medical care. Isolate yourself from other members of your family. There are now 4 approved or authorized vaccines in the United States: Pfizer-BioNTech, Moderna, Novavax, Johnson & Johnson's Janssen. Please see this website for more information. https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/overview-COVID-19-vaccines.html