Bloodborne Pathogens – Stats and Facts

DID YOU KNOW?

Hepatitis is an inflammation of the liver that can be caused by alcohol abuse, toxins, some medications, and other infections, but is most commonly caused by viruses. The most common types of viral hepatitis are hepatitis A, hepatitis B, hepatitis C, hepatitis D, and hepatitis E. Transmission and treatment vary depending on the type of hepatitis, but symptoms are similar for all types. Many people with hepatitis do not have any symptoms, but if symptoms do appear, they may include fatigue, nausea and vomiting, dark urine, a loss of appetite, and yellow-colored skin and eyes.

Hepatitis A is the milder form of hepatitis, which rarely causes death or lasting damage to the liver. Most people with hepatitis A recover in a few weeks or months. Hepatitis A, like hepatitis E, is transmitted through contaminated food or drinks, but is preventable through immunization. In 2017, there were just over 3,360 cases of viral hepatitis A infection in the U.S., with the state of Michigan reporting by far the highest rate of hepatitis A infection of any other U.S. state. At that time, the rate of death for hepatitis A was only 0.03 per 100,000 population for both males and 0 for females. However, the rate of death for hepatitis A increases with age.

Hepatitis B is transmitted through infected blood and other bodily fluids and is therefore commonly passed through sex, the sharing of needles, or from a mother to her child. A vaccine for hepatitis B does exist and infected adults usually recover from the disease within a few months and are immune to the disease afterwards. However, hepatitis B can cause cirrhosis, liver failure, and liver cancer and can result in death if left untreated. In 2017, there were around 3,400 cases of hepatitis B in the U.S., with the state of Florida accounting for 588 such cases, the highest number of

any U.S. state. The death rate from hepatitis B is low, but is slightly higher among males than among females. Furthermore, the death rate is significantly higher among Asian/Pacific Islanders than it is among any other race or ethnicity.

Hepatitis C, much like hepatitis B, is spread through infected blood. There is no vaccination for hepatitis C and, although in some cases it only lasts for a few weeks, it can also develop into a life-long chronic infection that can lead to cirrhosis, liver cancer, and death. In 2017, there were around 3,190 cases of acute hepatitis C infections in the U.S. However, during that year, viral hepatitis C caused 17,253 deaths. Acute hepatitis C requires no treatment, but chronic hepatitis C is treated with several different medications. Hepatitis C medications have changed and improved over the years and it is now predicted that, due to increased screening and the availability of new treatments, around 267,000 liver-related deaths due to hepatitis C will be avoided by the year 2050.

66 outbreaks (two or more cases) of viral hepatitis related to healthcare reported to CDC during 2008-2019; of these, 62 (94%) occurred in non-hospital settings.

Hepatitis B (total 25 outbreaks including two of both HBV and HCV, 183 outbreak-associated cases, 13,246 persons notified for screening):

- 19 outbreaks occurred in long-term care facilities, with at least 133 outbreak-associated cases of HBV and approximately 1,679 at-risk persons notified for screening
- 79% (15/19) of the outbreaks were associated with infection control breaks during assisted monitoring of blood glucose (AMBG)
- 6 outbreaks occurred in other settings, one each at: an outpatient cardiology clinic, a free dental clinic in school gymnasium, an outpatient oncology clinic, a hospital surgery

service, and two at pain remediation clinics (one outbreak of HBV and one with both HBV and HCV), with 50 outbreak-associated cases of HBV and 11,567 persons at-risk persons notified for screening

Hepatitis C (43 total outbreaks including two of both HBV and HCV, 328 outbreak-associated cases, >112,406 at-risk persons notified for screening):

- 16 outbreaks occurred in outpatient or long-term care facilities (including the two outbreaks of both HBV and HCV also listed above), with 134 outbreak-associated cases of HCV and >80,293 persons notified for screening
- 22 outbreaks occurred in hemodialysis settings, with 104 outbreak-associated cases of HCV and 3,134 persons notified for screening
- Four outbreaks occurred because of drug diversion by HCV-infected health care providers, with at least 90 outbreak-associated cases of HCV and 28,989 persons notified for screening

Single identified cases are not included in the table and may be particularly difficult to confirm as healthcare-associated infection transmission events. However, although this list is not exhaustive, during 2008-2018 the following single cases were reported and confirmed as likely patient-to-patient healthcare-associated transmission:

- 2019: A single case of HCV seroconversion in a long term care facility that provided hemodialysis. HCV sequences from case with seroconversion were 100% related to HCV sequences from another hemodialysis patient in the facility; infection control lapses in hemodialysis procedures included injection safety practices and inadequate environmental disinfection in the shared dialysis treatment area. (Wagner JM, Gandhi A, Johnson W et al. Hepatitis C Virus Transmission at a Long-term Care Facility (LTCF) Providing Hemodialysis

Services–Georgia, 2019. Accepted for the canceled 6th Decennial International Conference on Healthcare Associated Infections, Atlanta, March 26-30, 2020. Conference abstracts to be published in Infect Control Hosp Epi 2020 supplement.)

- 2018: A single case of HCV associated with receipt of IV therapy in an outpatient clinic with significant infection control breaches (unpublished data, Washington State Department of Health)
- 2017: Two single cases of HCV were identified in two outpatient hemodialysis units in Philadelphia (unpublished data, Philadelphia Department of Health)
- 2017: Two single cases of HCV case in two outpatient hemodialysis units in unidentified single state (unpublished data)
- 2016: a single HCV case in an outpatient hemodialysis unit in California (unpublished data, California Department of Health)
- 2015: 3 single HCV cases in 3 outpatient hemodialysis units in New Jersey (unpublished data, New Jersey Department of Health)
- 2015: an HBV case in an outpatient urology clinic (unpublished data, New York State Department of Health)
- 2015: a single HCV case due to syringe reuse in a hospital in Texas
- 2014: an HCV case in an outpatient dialysis clinic (unpublished data, State of New Jersey Department of Health) and an HCV case in an inpatient dialysis clinic (unpublished data, State of Massachusetts Department of Public Health)
- 2013: an HCV case in a dental clinic Oklahoma State Department of Health; Tulsa Health Department; Cleveland J, Kolavic Gray S, Harte J, et al. J Am Dental Assoc 2016; 147: 729-38.), an HBV case in an outpatient dialysis unit and two unrelated HCV transmissions in two New York endoscopy centers (Dentinger C et al. Acute HCV following outpatient endoscopy procedures, New York city, 2013. Presented at 2015 meeting of the American College of Gastroenterology.)
- 2012: an HCV case associated with healthcare delivery during

autologous stem cell transplant (unpublished data, State of New York Department of Health)
- 2011: an HCV case in a hospital surgery unit
- 2010: an HCV case in an outpatient surgical center, and an HBV case in a psychiatric long term care facility
- 2009 : an HCV case in an outpatient hemodialysis clinic (unpublished data, South Dakota Department of Health)
- 2008: an HCV case in a hospital surgery unit. (Unpublished data, Pennsylvania Department of Health)

KEEP IN MIND

Ergonomics is the science of designing the workplace, keeping in mind the capabilities and limitations of the worker. Poor worksite design leads to fatigued, frustrated and hurting workers. This rarely leads to the most productive worker. More likely, it leads to a painful and costly injury, lower productivity and poor product quality.

A systematic ergonomics improvement process removes risk factors that lead to musculoskeletal injuries and allows for improved human performance and productivity.

By making improvements to the work process, you are removing barriers to maximum safe work performance. You are providing your workers with a job that is within their body’s capabilities and limitations. And you’ll be contributing to your company’s bottom line.

Bloodborne pathogens are infectious microorganisms in human blood that can cause disease in humans. These pathogens include, but are not limited to, hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV). Needlesticks and other sharps-related injuries may expose workers to bloodborne pathogens. Workers in many occupations, including first responders, housekeeping personnel in some industries, nurses and other healthcare personnel, all may be at risk for exposure to bloodborne pathogens.

What can be done to control exposure to bloodborne pathogens?

In order to reduce or eliminate the hazards of occupational exposure to bloodborne pathogens, an employer must implement an exposure control plan for the worksite with details on employee protection measures. The plan must also describe how an employer will use engineering and work practice controls, personal protective clothing and equipment, employee training, medical surveillance, hepatitis B vaccinations, and other provisions as required by OSHA's Bloodborne Pathogens Standard. Engineering controls are the primary means of eliminating or minimizing employee exposure and include the use of safer medical devices, such as needleless devices, shielded needle devices, and plastic capillary tubes.

In general, the standard requires employers to:

- **Establish an exposure control plan.** This is a written plan to eliminate or minimize occupational exposures. The employer must prepare an exposure determination that contains a list of job classifications in which all workers have occupational exposure and a list of job classifications in which some workers have occupational exposure, along with a list of the tasks and procedures performed by those workers that result in their exposure.
- **Employers must update the plan annually to reflect changes in tasks**, procedures, and positions that affect occupational exposure, and also technological changes that eliminate or reduce occupational exposure. In addition, employers must annually document in the plan that they have considered and begun using appropriate, commercially-available effective safer medical devices designed to eliminate or minimize occupational exposure. Employers must also document that they have solicited input from frontline workers in identifying, evaluating, and selecting effective engineering and work practice controls.
- Implement the use of universal precautions (treating all human blood and OPIM as if known to be infectious for

bloodborne pathogens).

- **Identify and use engineering controls**. These are devices that isolate or remove the bloodborne pathogens hazard from the workplace. They include sharps disposal containers, self-sheathing needles, and safer medical devices, such as sharps with engineered sharps-injury protection and needleless systems.
- **Identify and ensure the use of work practice controls**. These are practices that reduce the possibility of exposure by changing the way a task is performed, such as appropriate practices for handling and disposing of contaminated sharps, handling specimens, handling laundry, and cleaning contaminated surfaces and items.
- **Provide personal protective equipment (PPE), such as gloves, gowns, eye protection, and masks.** Employers must clean, repair, and replace this equipment as needed. Provision, maintenance, repair and replacement are at no cost to the worker.
- **Make available hepatitis B vaccinations to all workers with occupational exposure.** This vaccination must be offered after the worker has received the required bloodborne pathogens training and within 10 days of initial assignment to a job with occupational exposure.
- **Make available post-exposure evaluation and follow-up to any occupationally exposed worker who experiences an exposure incident**. An exposure incident is a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or OPIM. This evaluation and follow-up must be at no cost to the worker and includes documenting the route(s) of exposure and the circumstances under which the exposure incident occurred; identifying and testing the source individual for HBV and HIV infectivity, if the source individual consents or the law does not require consent; collecting and testing the exposed worker’s blood, if the worker consents; offering postexposure prophylaxis; offering counseling; and evaluating reported illnesses. The healthcare professional will provide a limited written opinion to the employer and all diagnoses must remain

confidential.

- **Use labels and signs to communicate hazards.** Warning labels must be affixed to containers of regulated waste; containers of contaminated reusable sharps; refrigerators and freezers containing blood or OPIM; other containers used to store, transport, or ship blood or OPIM; contaminated equipment that is being shipped or serviced; and bags or containers of contaminated laundry, except as provided in the standard. Facilities may use red bags or red containers instead of labels. In HIV and HBV research laboratories and production facilities, signs must be posted at all access doors when OPIM or infected animals are present in the work area or containment module.
- **Provide information and training to workers.**Employers must ensure that their workers receive regular training that covers all elements of the standard including, but not limited to: information on bloodborne pathogens and diseases, methods used to control occupational exposure, hepatitis B vaccine, and medical evaluation and post-exposure follow-up procedures. Employers must offer this training on initial assignment, at least annually thereafter, and when new or modified tasks or procedures affect a worker's occupational exposure. Also, HIV and HBV laboratory and production facility workers must receive specialized initial training, in addition to the training provided to all workers with occupational exposure. Workers must have the opportunity to ask the trainer questions. Also, training must be presented at an educational level and in a language that workers understand.

What is hepatitis B?

Hepatitis B is a liver disease caused by the hepatitis B virus (HBV). HBV is far more infectious than HIV and can be prevented by a vaccine. People who have not been vaccinated may be at risk of getting infected.

About 95 percent of adults will recover within 6 months of becoming infected (acute hepatitis B) and as a result will develop

lifelong protection against it. The remaining 5 percent are unable to clear the virus and will become chronically infected. Chronic hepatitis B infection is treatable.

It is estimated that less than 1 percent of Canada's population is infected with either acute or chronic HBV. People who are infected before the age of 7 are at a higher risk of developing chronic infection. In 2011, the overall reported rate of acute hepatitis B infection in Canada was 0.6 reported cases per 100,000 people living in Canada.

Why is hepatitis B a health concern?

Many people infected with HBV do not know they have the virus because symptoms can take two to six months to appear and only about 50 percent of people develop symptoms. During this time, they can spread the infection to others. You may not know you have this infection until damage has already been done to your liver. Potential complications from chronic HBV infection include cirrhosis of the liver, liver failure, liver cancer and premature death.

Why do I need my liver?

It's important to keep your liver healthy because it plays a key role in your overall health. It helps digest food and stores vitamins and minerals. Most importantly, the liver acts as a filter for chemicals and other substances that enter the body. It is also important in the production of your blood and many of the proteins that keep your body working.

How is hepatitis B spread?

HBV is spread through contact with infected blood and body fluids including semen and vaginal fluid.

The most common risk factors for HBV

infection include:

- Injection drug use (past and/or present) and intranasal drug use (snorting) when sharing contaminated drug-using equipment (e.g., needles, straws pipes, spoons and cookers);
- High-risk sexual activities (e.g., unprotected sex, multiple sexual partners);
- Being born or living in a region where HBV is widespread;
- Being born to a mother with HBV;
- Exposure to blood/blood products in endemic regions without routine infection control measures;
- Use of shared or contaminated medical or dental devices;
- Sharing personal care articles such as razors, scissors, nail clippers or toothbrushes with an infected person;
- Exposure in the workplace by getting pricked by a needle or sharp equipment that had infected blood or body fluids on it;
- Tattooing, body piercing or acupuncture when unsterile equipment or techniques are used; and
- Exposure to blood, blood products or organ transplantation in Canada prior to 1970.

Hepatitis B is NOT spread by casual contact such as hugging, kissing or shaking hands or by being around someone who is sneezing or coughing. It cannot be spread by breastfeeding unless the nipples are cracked and bleeding. The hepatitis B virus is not found in food or water.

Transmission through saliva not visibly contaminated with blood is uncommon.

What are the symptoms of hepatitis B?

You may have hepatitis B and not have any signs or symptoms. Symptoms of HBV infection can include some or all of the following: fatigue, loss of appetite, fever, nausea, vomiting, dark urine, pale stools, stomach pain, joint pain and jaundice (yellowing of the skin and eyes). About half of the people infected with HBV don’t develop any symptoms until their liver has already been damaged – that’s why it’s important to take

precautions against HBV, and to get tested if you think you might be infected.

How can I protect myself and others against HBV?

There is a safe and effective vaccine available to prevent you and others from getting hepatitis B. In Canada, all provinces and territories have free immunization programs for children and certain groups of adults.

If you are pregnant and infected with hepatitis B, it is important for you to know that your infant is at a high risk of developing chronic HBV infection. In Canada, it is recommended that infants born to infected mothers receive a special injection immediately after birth, as well as, the first dose of vaccine within 12 hours of birth to help prevent infection.

Hepatitis B vaccination is the best way to protect yourself against becoming infected. You can also reduce the risk of hepatitis B infection by taking the following precautions:

- Avoid sharing needles/syringes, spoons, drug solutions or water, filters, cookers, pipes, straws used for snorting drugs, and other drug related equipment. Cleaning with bleach may not kill HBV;
- Practice safer sex. Use condoms/dental dams to reduce the risk of acquiring sexually transmitted and blood borne infections (STBBIs) including HBV;
- Avoid dental, medical or cosmetic procedures that penetrate the skin (e.g., transfusions, acupuncture, piercing or tattooing) unless you are certain that the needles, materials and equipment are sterile;
- Wear latex gloves if you are likely to be in contact with someone else’s blood or bodily fluids;
- Don’t share personal items like razors, scissors, nail clippers or toothbrushes; and
- Be especially careful when travelling abroad in countries where HBV is widespread.

How can I find out if I have acute or chronic hepatitis B?

If you think you are at risk, or may be infected with hepatitis B, talk to your healthcare provider about testing for hepatitis B, and the hepatitis B vaccination.

What if I have hepatitis B?

Most adults with hepatitis B infection will clear the virus on their own within 6 months. If you clear the virus, you will no longer be infected and will not be able to transmit the virus to others. You will also have antibodies that protect you from getting hepatitis B again. Until your health care provider tells you that you have cleared the virus, you are still infectious and can transmit the virus to others. Management and care of acute HBV infection is focused on relief of symptoms, preventing complications and further transmission.

If you have a chronic HBV infection your healthcare provider will monitor you closely with blood tests to keep an eye on your liver health and may recommend treatment. Not all people with chronic HBV infection need to be treated. A combination of medications can be used to treat hepatitis B. Talk to your health care provider to see if treatment is right for you.

To prevent further damage to your liver, your health care provider may advise vaccination against hepatitis A. Many provinces and territories provide this vaccination at no direct cost to you. In addition, you may want to limit or avoid alcohol consumption to decrease your risk of liver damage.

If you have either an acute or chronic infection, you should advise anyone who may have been exposed to your blood or bodily fluids (e.g., sexual partners, people you live with, and health care workers). These people should consult a health care provider right away as there are ways to prevent them from getting the infection.

If you have acute or chronic hepatitis B, you may infect

others. You can prevent spreading the virus by following the same safe sex, drug behaviour and personal hygiene precautions outlined to reduce your risk of infection. Additionally:

- Never donate blood, tissue, organs or semen;
- Ensure that family members living with you, sexual partners and drug use partners are tested for HBV and immunized if at risk;
- If you are pregnant, inform your health care provider so that all the necessary precautions for the baby are taken at or soon after birth; and
- Cover open sores or breaks in your skin.

Remember

Hepatitis B is a vaccine-preventable disease.

Chronic hepatitis B is treatable. If you think you may be infected with hepatitis B, it is important to find out if you have the virus so that you can take the necessary steps to protect yourself and others.