



MURRAY STATE
UNIVERSITY

Murray State's Digital Commons

Integrated Studies

Center for Adult and Regional Education

Fall 2017

The Five W's of Bloodborne Pathogens: Who, What, When, Where, and Why

Sallie Hunter
sallie.wright13@gmail.com

Follow this and additional works at: <https://digitalcommons.murraystate.edu/bis437>

Recommended Citation

Hunter, Sallie, "The Five W's of Bloodborne Pathogens: Who, What, When, Where, and Why" (2017). *Integrated Studies*. 70.
<https://digitalcommons.murraystate.edu/bis437/70>

This Thesis is brought to you for free and open access by the Center for Adult and Regional Education at Murray State's Digital Commons. It has been accepted for inclusion in Integrated Studies by an authorized administrator of Murray State's Digital Commons. For more information, please contact msu.digitalcommons@murraystate.edu.

The Five W's of Bloodborne Pathogens: Who, What, When, Where, and Why

Sallie L. Hunter

Murray State University

Abstract

Bloodborne pathogens are all around us, yet we seldom think about them. Exploring the who, what, when, where, and why aspects of bloodborne pathogens allows to develop a better comprehension of the world we live in and how to protect and prevent the spread of infectious disease. Human Immunodeficiency Virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) are the top three bloodborne pathogens and the main focus of this entry. This article is designed to be easy to read and readily understood in order to appeal to a much broader range of individuals who may have questions about bloodborne pathogens.

Introduction

In accordance with the Occupational Safety and Health Administration (OSHA), bloodborne pathogens are defined as “infectious microorganisms in human blood that can cause disease in humans” (OSHA, n.d., paragraph 1). The American Red Cross states that “bloodborne pathogens, such as bacteria and viruses, are present in blood and body fluids and can cause disease in humans” (The American National Red Cross, 2011, p.1). Human immunodeficiency virus, more commonly known as HIV, affects an estimated 34 million people worldwide. Worldwide, an estimated 350 million people have hepatitis B and, 150-350 million individuals are infected with hepatitis C (Department of Health and Human Services, 2010). While these numbers are astonishing, it is disappointing to know that there are a large number of those infections that could have been prevented. Individually, the three infectious diseases mentioned are recognized, but when grouped into a unit, what are they? The Occupational Safety and Health Association (OSHA) defines them as bloodborne pathogens. The purpose of this paper is to discuss the most common bloodborne pathogens in the United States, the signs and symptoms associated with the pathogens, those at greater risk for acquiring the pathogens, and preventative measures. Bloodborne pathogens are to be taken seriously but not feared; therefore, education on this is essential to improve the understanding of this topic and reduce the incidences of the disease.

Human Immunodeficiency Virus (HIV)

What:

“Human immunodeficiency virus (HIV) is a viral infection that weakens the immune system and is a subsequent causative agent of acquired immunodeficiency syndrome (AIDS).

The virus is transmitted through the exchange of a variety of bodily fluids mainly sexually, perinatal, and blood-borne. HIV/AIDS is one of the highest contributor to morbidity, and it is the sixth leading cause of mortality worldwide” (Rumbwere, Dube, Marshall, & Ryan, 2016, p.1). The Center for Disease Control and Prevention (CDC) estimated that in 2014 the United States alone had approximately 1.1 million individuals infected with HIV. Sadly, of that 1.1 million, 15% did not know they had been infected with HIV. In the year 2015, an astonishing 39,513 individuals were newly diagnosed with HIV in the U.S. alone. While this is a 9% decrease from 2010 it is still a large number, that in some instances, could have been prevented. This virus does not discriminate. It does not care about sex, race, or ethnicity. The virus does not care where you live or what kind of car you drive. It does not care how pretty you are or how well kept you consider yourself.

Who:

Although it does not pick its victims, it is prevalent within certain demographics and weighs heavily on certain lifestyles. It's only target for potential candidates are those who place themselves in the way of risky behaviors and chose to not take necessary precautions to protect themselves. In 2014 reports indicate that male to male sexual contact accounted for 70% of new diagnoses with 45% of those males being African American (Center for Disease Control and Prevention, 2017). This is, of course, not without a cause like most things, there is one exception and that is a child who contracted the virus via mother's womb. Obviously, while the mother's risky behavior unfortunately jeopardized the unborn baby, that is not the child's fault, so that is exempt from the previous statement. “In 2014, an estimated 2,477 children aged <13 years were living with diagnosed human immunodeficiency virus (HIV) infection in the United States” (Tanner, Bush, Nesheim, et al, 2017, pg. 1033).

“Estimates suggest that over 16 million people worldwide inject drugs and 3 million of those people are infected with HIV” (DARA Thailand, 2017, paragraph 5). That is a pretty stout number and should leave an impression. While there are programs that are established in order to decrease the amount of “dirty needles” on the streets, they are still in play and still affect those in their path. Recreational drug use has become an increasingly dominant trend over the years and that reflects in the increased number of patients diagnosed with HIV, not to mention those who have not been tested and placed on some sort of treatment therapy in order to reduce transmission. Many states, including but not limited to Kentucky, have pieces of legislation in place protecting those who come in contact with individuals who have HIV or AIDS and do not disclose that information before risky behaviors occur.

In 2014 there were an estimated 6,511 people living with diagnosed HIV in Kentucky. By the end of 2014, the mortality rate for the year was 112 individuals. Unfortunately, by 2015 there were an added 336 newly diagnosed cases of HIV. Kentucky statistics show that of the 6,511, 80% were men and 20% were women, along with 56% being of the Caucasian race, 33% black, and 6% Hispanic/Latino. 27.2% of Kentuckians will be diagnosed with AIDS within three months of the initial HIV diagnosis (AIDSVu, n.d.).

“CDC’s National HIV Behavioral Surveillance (NHBS) monitors behaviors among populations at risk for acquiring or transmitting HIV infection. Recent NHBS data indicate that persons at risk for HIV infection who had ever received testing for HIV are testing at shorter intervals than in the past. The average interval in months between two successive HIV tests decreased from 21.1 in 2010 to 19.9 in 2013 among heterosexuals at increased risk for HIV, from 10.5 in 2009 to 7.7 in 2014 among men who have sex with men, and from 14.4 in 2009 to 11.5 in 2015 among persons who inject drugs” (Stein, Song, et al, 2017, pg. 629).

When:

Statistics show that “Gay and bisexual men have the largest number of new diagnoses in the United States” (U.S. Department of Health and Human Services, 2017, paragraph 4). Also, transgender women who have sex with men are among the groups at highest risk for HIV infection. Anal sex is the highest-risk sexual behavior. Individuals who are HIV negative and being a receptive partner (or bottom) for anal sex is the highest-risk sexual activity for getting HIV. The Center for Disease Control and Prevention reports that anal sex is a high-risk behavior due to “the lining of the rectum is thin and may allow HIV to enter the body during anal sex” (2017, paragraph 2). Being HIV positive and being the insertive partner (or top) for anal sex is the highest-risk sexual activity for transmitting HIV (U.S. Department of Health and Human Services, 2017). Research and statistics related to HIV can be found in every media outlet. Even with risk factors of contracting and transmitting HIV known, there are still huge numbers of new cases. Why is there an increase in these rates? One reason is that some people are either uneducated on protection or they are too proud to admit that they do practice high-risk behaviors they could put them at risk for contracting HIV. Many have the mentality that “it won’t happen to me” and that is an inaccurate statement to assume. There are too many variables that could make those individuals susceptible to the virus including but not limited to, just down right unfaithfulness between partners and lack of honesty between partners.

Why:

Preventative measures and education are imperative in order to achieve a steady decrease in HIV. Human immunodeficiency virus is defined as a virus spread through certain body fluids that attacks the body’s immune system, specifically the CD4 cells, often called T4 cells

(HIV.gov, 2017). This infection is acquired through blood and bodily fluids inhibits the body's natural immune system to fight off the disease can in turn result in the development of AIDS (acquired immunodeficiency syndrome). AIDS is the most severe stage of HIV and results in the infected patient being highly susceptible to opportunistic infections, or simple, severe illness. At this point, the immune system is so greatly damaged there is no way to reverse the damage. HIV is irrevocable, once acquired, it may be controlled with medicine but will not dissipate or be cured.

In beginning stages, HIV often mimics flu like symptoms, and many times that is exactly what the infected individual thinks is going on. Symptoms such as fever, body aches, sore throat and rashes are a few of the experienced symptoms generally within the first two to four weeks of exposure (HIV.gov, 2017). This is considered to be an acute phase or stage of the virus and it is crucial to be seen by a physician at this point to decrease the chances of further damage. It is also the most likely time to transmit the HIV to a sexual partner or between individuals who share needles, as this is when the highest production of the virus occurs within the body. "During this early period of infection, large amounts of virus are being produced in your body. The virus uses CD4 cells to replicate and destroys them in the process. Because of this, CD4 cells can fall rapidly. Eventually the immune response will begin to bring the level of virus in the body back down to a level called a viral set point, which is a relatively stable level of virus in the body. At this point, the CD4 count begins to increase, but it may not return to pre-infection levels. It may be particularly beneficial to personal health to begin ART during this stage" (HIV.gov, 2017, paragraph 9). Doctors original treatment approach to HIV and AIDS was focused on "prevention strategies and treatment of symptomatic diseases, but due to the benefits of ART, the emphasis has now moved to earlier HIV diagnosis" (Rumbwere Dube, B.N., Marshall, T.P., Ryan, R.P.,

2016, p.1-2). Early detection helps to keep irreversible damage from occurring and to inhibit the transition of HIV to AIDS. The screening process along with the treatment regimen have both gotten increasingly better over the years.

Scientific development has made huge strides in increasing availability of antiretroviral therapy (ART) and more cost-efficient pharmaceuticals to slow and even halt the progress of HIV. Antiretroviral therapy, when taken in combinations, is currently the most effective form of treatment available for HIV patients. The wording “combinations” denotes this form of drug therapy is better when taken in approximately groups of threes versus a monotherapeutic approach of one form of antiretroviral therapy drug alone (Thompson, G. and Shalit, P., 2014). This medication, when taken properly in conjunction with living a healthy lifestyle can enable an individual to live a long life while also decreasing the chances of infecting others (HIV.gov, 2017).

Where:

There are many ways to decrease the likelihood that human immunodeficiency virus will be spread but it is up to those participating in risky behaviors to put those preventative methods into practice. The practice of using condoms will greatly decrease chances of contracting or transmitting HIV, while it is not 100% it is very close. It is imperative when using condoms that the condom itself is properly cared for, and that they are kept stored in the proper environment that is cool and dry (Center for Disease Control and Prevention, 2017). The only guaranteed way to 100% prevent contracting or transmitting HIV is to abstain. Abstinence is defined as someone that has never had sex or those that have had sex in the past but chose to stop for an extended amount of time. Limiting the number of sexual partners also plays a role in lessening exposure to

HIV. The more sexual partners an individual has, the greater the risk of coming into contact with someone with a HIV viral load that is not suppressed, leaving that individual with a greater chance of contracting the virus (Center for Disease Control and Prevention, 2017). Preventative measures and education are imperative in order to achieve a steady decrease in statistical analysis of HIV.

Hepatitis B Virus (HBV)

What:

With over two billion individuals affected worldwide and taking the rank at the tenth leading cause of death, Hepatitis B virus has wrecked its havoc. According to the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), the definition of hepatitis B virus is a “viral infection that causes liver inflammation and damage. Inflammation is swelling that occurs when tissues of the body become injured or infected. Viruses invade normal cells in your body. Many viruses cause infection that can be spread from person to person. The hepatitis B virus spreads through contact with an infected person’s blood, semen, or other body fluids” (National Institute of Diabetes and Digestive and Kidney Disease, 2017, paragraph 1).

Hepatitis B virus is highly common and very contagious. “Researchers estimate that about 850,000 to 2.2 million people in the United States have chronic hepatitis B” (National Institute of Diabetes and Digestive and Kidney Disease, 2017, paragraph 7).

Who:

Sadly, the most common individual subjected to hepatitis B virus are innocent infants. Those who are born to mothers who have the virus are the most likely to contract hepatitis B virus, with most of those being born in countries with high HBV rates or infants born in the United States who were unvaccinated and have parents who were born in an area with high HBV

rates. “In the United States, 47 to 95 percent of people with chronic hepatitis B were born outside the United States, in parts of the world where hepatitis B is more common” (National Institute of Diabetes and Digestive and Kidney Disease, 2017, paragraph 8).

“In the United States, sexual contact is the most common way that hepatitis B spreads among adults. Injection drug use is another important way that hepatitis B spreads. Since 2009, the number of acute hepatitis B infections has risen in some Appalachian states, especially among adults who inject drugs” (National Institute of Diabetes and Digestive and Kidney Disease, 2017, paragraph 9). Individuals residing in the prison system are also at a large risk of contracting hepatitis B virus. “Globally, there are more than 10 million people in prison at any one time, and a significant portion of these are at risk of acquiring or transmitting hepatitis B infection” (Society for the Study of Addiction, 2010, pg. 189).

When:

There are multiple vectors of transmission making it wide spread. HBV is in blood, semen, saliva, vaginal secretions, menstrual secretions, and to a lesser extent in breast milk, sweat, tears, and urine of infected individuals (Lavanchy, 2004). This leaves a fairly large door open for opportunities of transmission from person to person. Although one of the most common modes of transmission is *in vitro*, from mother to unborn child through *in utero*. Generally, this occurs in areas with large concentrations of the hepatitis B virus infection, most often outside of the United States. Also, the infection can occur in infants born in the United States who were unvaccinated with parents who were from an area where hepatitis B was common (National Institute of Diabetes and Digestive and Kidney Disease, 2017). “About 90 percent of infants infected with hepatitis B develop a chronic infection. About 25 to 50 percent of children infected

between the ages of 1 and 5 years develop chronic infections” (National Institute of Diabetes and Digestive and Kidney Disease, 2017, paragraph 6).

Because of the resilience of the hepatitis B virus, prisons are a thriving environment for the transmission of the virus. “Prisons are a special environment where there are very high concentrations of injecting drug users, some of whom continue to inject and share within the prison setting. When such prisoners do continue to inject, they are more likely to engage in riskier practices and hence are at particular risk of blood-borne virus transmission” (Society for the Study of Addiction, 2010, pg. 189). Unlike HIV, hepatitis B is very resilient making it capable of living outside the body but, very similarly to HIV, HBV can be transmitted in the same ways. In fact, another risk factor is if someone already has HIV, they are at a greater risk of contracting hepatitis B virus.

Why:

The hepatitis B virus infection causes extensive damage to internal organs resulting in extensive and costly health issues. Once the body begins to detect hepatitis B virus antigens (HBeAg) it goes into war mode. The body's first response system calls warriors into action in attempt to ride the body naturally of the infectious virus and the presenting patient's immune system kicks into over drive. This causes the patient's ALT (alanine aminotransferase) levels to begin elevating, this enzyme is one of several referred to as a liver enzyme. At this point, either the patient will clean their body of HBeAg, resulting in antibodies (anti-HBe antibodies) that are undetectable or of very low detection of the hepatitis B virus. If that does not occur, the ALT and anti-HBe antibody levels will continue to rise resulting in chronic hepatitis B virus infection. In this case, a treatment plan would be organized and initiated to allow for the best continuity of patient care.

Treatments have been the subject of research for quite some time, and in 2009 there was a release of new revelation in therapeutic drugs for treatment of HBV. “Based on these new findings, the recommendation for first-line oral antiviral medications has been changed to tenofovir or entecavir, and adefovir has been moved to second-line oral antiviral medication. Interferon remains one of the first-line options for patients who do not have cirrhosis” (Lok & McMahon, 2009, p.661). While there are other treatments available, not all are globally accepted. Interferon (conventional alpha) and lamivudine are currently the only two available for global use. Adefovir dipivoxil has been approved for use in the United States and Europe as of now (Lavanchy, 2004).

Where:

The economic burden of Hepatitis B is significant due to a high death rate. In 2004, 1.25 million people were chronic HBV carriers. Sadly, most of these were immigrants from areas of high HBV concentration. One study showed that during the first seven months health care costs were 3.3 times higher in those with chronic Hepatitis B than those of the control (Lavanchy, 2004). Because of this, vaccinations have played a huge role in treatment as well as reconciling cost effectiveness. The prevention that the Hepatitis B vaccination provides is critical in decreasing the number of individuals diagnosed with the virus. In return, this allows for lower health care costs in the war against HBV and liver failure.

Vaccination was originally introduced to Asia in 1984 to the babies of mothers with known HBV. This process went on for a couple years then began being extended to all newborn babies and children of pre-school age who had not been vaccinated (Lavanchy, 2004). While the vaccination was introduced slowly into the general public, it has made a significant impact and statistics show decreasing numbers of individuals diagnosed with HBV as a result. Since 1991

the United States has seen an 82% decrease in new cases of hepatitis B due to doctor's recommendation of U.S. children to receive the hepatitis B vaccine (National Institute of Diabetes and Digestive and Kidney Disease, 2017). "Vaccination is the most effective tool in preventing the transmission of HBV infection. Strategies targeting just high-risk groups cannot control HBV infection throughout the population. Broader vaccination programs are required including infants, children, health care workers, and pregnant women" (Lavanchy, 2004, p.103).

Hepatitis C Virus (HCV)

What:

As with hepatitis B virus, hepatitis C virus is a viral infectious disease that leads to inflammation of the liver. Hepatitis C Virus is currently the most common bloodborne pathogen in the United States with new cases arising routinely (Bureau of HIV, STD, and Hepatitis, 2017). The Mayo Clinic states that hepatitis C spreads through contaminated blood, and was once felt to be treatable but not curable. Now studies have proven HCV to be a curable disease under most circumstances (Mayo Clinic, 2017). This viral infection can lay dormant for several years and may take a long time for an individual to even know they have it.

Who:

To date the largest group of people at risk of HCV are the "baby boomers" those born between 1945 and 1965. "While anyone can get Hepatitis C, more than 53% of adults diagnosed with HCV in 2016 are baby boomers" (Bureau of HIV, STD, and Hepatitis, 2017, p.1). It is unclear as to why this population has the highest rate of hepatitis C virus, but it is speculated to be because this time frame was before blood products were thoroughly examined before given. Also, these dates were before the development and implementation of universal precautions. It is

thought that most baby boomers, at this point, have lived with hepatitis C virus for 20 to 40 years (Bureau of HIV, STD and Hepatitis, 2017). In conjunction with baby boomers, studies show that most newly acquired infections in the United States are among 30-35-year-old young adults.

When:

While baby boomers are the largest demographic group affected by the infectious virus, they are hardly the only ones at risk. Obviously, those who have repeated exposure or large amounts of exposure to blood from individuals positive for hepatitis C virus are at the greatest risk of contraction. For example, those who have received blood transfusions and/or blood products, as well as those who have a history or current use of sharing needles through drug abuse (injection drug use) are at a higher risk of developing hepatitis C (Mayo Clinic, 2017). “Fewer sharing partners are necessary to sustain HCV transmission than are necessary for other bloodborne viruses, and indirect drug sharing and preparation practices, such as backloading and sharing cotton, cooker, and rinse water, have been associated with HCV transmissions” all of which pertain to illicit drug use (Atler, 2007, p. 2438). Other examples of those at risk for hepatitis C virus include, anyone who has received a tattoo or piercing in an unprofessional manner. In addition to, any child born to a mother positive for hepatitis C virus and any healthcare workers exposed to infected blood are at risk. As well as, anyone who is currently HIV positive and anyone who has been in the prison system are at a greater risk of contracting hepatitis C. Finally, anyone who has had multiple sexual partners puts themselves in a position for highly probable repeated exposure to hepatitis C virus increasing risks of falling victim to the infectious disease. Although, these risk factors do not guarantee the virus is present, it highly increases the chances of transmission.

Why:

Hepatitis has serious implication when left untreated but unfortunately, most people that have HCV are undiagnosed and untreated. There are many symptoms including, extreme tiredness, yellowish discoloration of skin and whites of eyes, easy bruising, weight loss, confusion, swelling, and easy bleeding to name a few. Keep in mind that Hepatitis C Virus infection is a silent killer as it can lay asymptomatic and dormant for years, even up to decades before prevailing. Due to the chronic nature of this virus, when signs and symptoms present, it is usually related to the extensive liver damage that is already taken place because of the hepatitis C virus. “Every chronic hepatitis C infection starts with an acute phase. Acute hepatitis C usually goes undiagnosed because it rarely causes symptoms” (Mayo Clinic, 2017, paragraph 5). There have been cases of spontaneous viral clearance where acute HCV did not turn chronic due to the body’s own ability to fight off or absorb the virial infection.

While Hepatitis C virus has the potential to lay dormant for several years, generally symptoms in the acute phase of the virus appear one to three months after exposure. These symptoms tend to only stay present for a few weeks to months before turning chronic or the rare occasion the body wards off the virus on its own. “For some people, hepatitis c is a short-term illness but for 70%-85% of people who become infected with Hepatitis C, it becomes a long-term, chronic infection” (Center for Disease Control and Prevention, 2015, paragraph 1).

There are different genotypes, or distinct forms, of Hepatitis C Virus and treatment is dependent of the specific genotype. There are currently six different genotypes that have been identified. These six genotypes are geographically distributed throughout the globe. “HCV types 1 and 2 have been found in almost all countries tested, including those in Europe, North America, and the Far East. Although HCV type 3 has not been found in Japan, it has frequently been reported from Europe, Thailand, and India. In the Middle East, almost all anti-HCV-

positive individuals identified on blood donor screening are infected with type 4, which has also been detected in NANBH patients in Zaire. HCV types 5 and 6 show highly restricted geographical distributions, being apparently confined to South Africa and Hong Kong respectively” (Simmonds, et., 1993, p. 2397).

Where:

In terms of distribution of the virus geographically, hepatitis c virus is universal. It is present all over the world leaving some statistics unfulfilled because of remote areas inability to provide information. In some regions, it is noted that a pattern of transmission occurred in the last 20 to 40 years prevailing among young adults. In contrast, other regions show a pattern of steady increase with age primarily 50 years of age and older. An exception to both of these is Egypt. Egypt shows an increase with age and an overall increase among the general population. This not only indicates a risk in the distant past but also an ongoing persistence in transmission even though recently acquired HCV can be difficult to detect due to being asymptomatic. On a positive note, the United States has shown a drastic decline in hepatitis C virus reporting in at greater than 80% since 1989, with Italy's rate also showing steady declines (Atler, 2007).

According to the Mayo Clinic, only about 45% of patient treated with standard, antiviral therapy for hepatitis c virus are cured of the infection. Currently, there are 40 new treatments being explored and two of those will be released this year. The older treatments, Interferon and Ribavirin, cue the individual immune system to attack the hepatitis c virus, while new treatments are attacking the virus itself head on with only minimal side effects to the individual taking them. They are also projected to increase the success rate from 45% to 70%.

Universal Precautions and other Prevention Methods

Universal precautions are an effort in making advances towards infection control. The idea behind universal precautions is to treat all blood and body fluids as if they are infected with any bloodborne pathogen. The process was created by the Center for Disease Control and Prevention in August of 1987. It was initially developed as a set of guidelines or procedures “to prevent parenteral, mucus membrane, and nonintact skin exposures of health care workers to bloodborne pathogens” (Farlex Partner Medical Dictionary, 2012, paragraph 1).

From a health care perspective, it is very important to maintain a good supply of personal protective equipment (PPE) and to utilize it accordingly in order to achieve optimal success with avoiding bloodborne pathogens. Personal protective equipment refers to such supplies as disposable gloves, masks, eye wears, water resistant clothing covers in the way of gowns, shoe coverings, and head coverings. In most cases, not all of these sources of PPE need to be utilized at the same time, but it is imperative to know what and when to use the appropriate means of protection. Studies show support for when to wear different forms of PPE. For example, in a surgical setting “Evidence supports the use of double gloving and double gloving with an indicator glove system to decrease the risk of percutaneous injury and therefore is an effective barrier to bloodborne pathogen exposure” (Childs, 2013, pg. 586). While this may not be the case for every area of health care, it is a great example of how personal protective equipment provides an effective barrier against bloodborne pathogens.

Universal precautions apply to multiple bodily fluids such as “blood, unfixed tissues, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid, semen and vaginal secretions, nasal secretions, sputum, sweat, tears, urine, or vomitus” (Farlex Partner Medical Dictionary, 2012, paragraph 1). While universal precautions were created with health care workers in mind, they are a set of guidelines that can be applied to every person in

everyday life. Individuals who practice keeping themselves safe from all bodily fluids under all circumstances are most definitely less likely to contract bloodborne pathogens such as HIV, hepatitis B virus, and hepatitis c virus.

Another preventative method against bloodborne pathogens is abstinence. While some acknowledge abstinence in a negative mind-frame of self-deprivation, it is in fact the best prevention against bloodborne pathogens. Although there are other methods of contracting infectious diseases, sexual transmission is responsible for spreading the majority of bloodborne pathogens. Not only the act of sex, but also sexual favors and the number of sexual partners determines the increased risk an individual face.

Illicit drug use, while legally unacceptable, is also another highly responsible vector for transmission of bloodborne pathogens. As previously stated, needle sharing isn't the only way for transmission to occur with drug use. It has also been proven that bloodborne pathogens can be contracted through indirect drug sharing and preparation practices, such as backloading and sharing cotton, also in the cooking process, and in the rinse water (Atler, 2007). Several areas nationally are taking a stand in the world of injection drug use to provide safer methods and supplies restrictions in order to reduce and prevent the spread of bloodborne pathogens. "Every state, the District of Columbia (DC), and The Virgin Islands (VI) have enacted state or local laws or regulations that restrict the sale, distribution, or possession of syringes. Drug paraphernalia laws prohibiting the sale, distribution, and/or possession of syringes known to be used to induce illicit drugs into the body exist in 47 states, DC, and VI. Syringe prescription laws prohibiting sale, distribution, and possession of syringes without a valid medical prescription exist in 8 states and VI. Pharmacy regulations or practice guidelines restrict access to syringes in 23 states" (Gostin, Lazzarini, Jones, & Flaherty, 1997, pg. 53).

Other prevention methods might include new improved means of delivering “the message”, in other words, vamped up education could be a much-needed tool to influence the hard to reach population. Most individuals in today’s society don’t consider themselves “drug addicts”, they tend to view themselves as healthy and self-aware individuals which means there must be a different approach to delivering the message of bloodborne pathogens and safety. The idea of more discrete testing also helps reach those who feel they don’t have a problem with drug use (Bennett, 2015).

Educational programs are another effective way to deliver insightful information to a mass crowd. In health care settings it isn’t uncommon to staff to do yearly continuing education units on different common areas for the staff. In those trainings, bloodborne pathogens are always a topic for coverage. It serves as a reminder to established staff and an educational tool to new and possibly unknowing staff of the severity of infectious diseases and the means necessary to protect one’s self in a health care setting. Many school systems also implement education courses on sexual activity, which include information on sexually transmitted infections and that opens a window to introduce the hazards of bloodborne pathogens in conjunctions with the importance of safe sex practices and the practice of abstinence. While it is important to error on the side of caution making sure the website is viable, reliable information, there are always good sources to be found online such as The Center for Disease Control and Prevention and The United States Department for Health and Human Services to name a couple. There is even a National HIV Testing Day that takes place on June 27 to raise awareness of the importance of prevention, detection and treatment. This is a nationwide day of awareness developed by the Center for Disease Control and Prevention (Stein, Song, et al, 2017)

Legalities

As touched on earlier in the writing, if an individual knowingly has HIV, hepatitis B, and/or hepatitis C virus, it is not only their due diligence to disclose that information to anyone who it might affect, but it is also the law. Sexual partners or potential sexual partners, health care workers, dentists, co-workers, and anyone that could possibly come in contact with any of the transmission vectors has the right to know if they are being put at risk of contracting a bloodborne pathogen. “During the early years of the HIV epidemic, a number of states implemented HIV-specific criminal exposure laws. These laws impose criminal penalties on people living with HIV who know their HIV status and who potentially expose others to HIV” (Center for Disease Control and Prevention, 2017, paragraph 1). These laws are taken very seriously, as exposing individuals to potentially fatal infectious disease is considered reckless endangerment and in some cases even more intense charges could occur, even attempted murder in some states. While most of the laws are state to state, some are federally instituted. “By 2011, a total of 67 laws explicitly focused on persons living with HIV had been enacted in 33 states. In 24 states, laws require persons who are aware that they have HIV to disclose their status to sexual partners and 14 states require disclosure to needle-sharing partners. Twenty-five states criminalize one or more behaviors that pose a low or negligible risk for HIV transmission” (Center for Disease Control and Prevention, 2017, paragraph 3).

Provisions to protect health care workers from bloodborne pathogens began in California in 1998, these laws were specifically aimed at needlesticks in healthcare. By 2002 some twenty-one states had jumped on board to develop new and improve old policies that protect against bloodborne pathogens in working healthcare professionals (Center for Disease Control and Prevention, 2016). “These state laws are aimed at adding additional safeguards for health care workers at the state level. This includes adding provisions not in the federal OSHA Bloodborne

Pathogen standard and/or coverage of public employees not regulated by OSHA” (Center for Disease Control and Prevention, 2016, paragraph 2).

While it is noted that some states need to update their statutes to accommodate to the new advances in drug therapy for HIV patients, Kentucky has already done such. Kentucky has also adjusted to include improvements made to hepatitis B and hepatitis C virus as well. In conjunction to individuals with infectious diseases disclosing that information, healthcare providers must also provide positive results for each bloodborne pathogens within a given amount of time. Providers must also include means for counseling services to be established and treatment to begin, all per state legislation.

Conclusion

In conclusion, once again, bloodborne pathogens are tiny microorganisms that have multiple vectors of transmission which allow for more possibilities of contraction without preventative measures. The idea of self-awareness is so much more than just paying attention to detail. It could potentially be the future one faces if individuals fail to use protection, choose to abstain, and/or choose to practice good judgement. In a party time, care free life style, a “good time” could easily turn into a whole new world very quickly. And in a healthcare setting, carelessness can be critical for one’s self as well as for patient care. It is very important to follow all universal precaution policies put into place in order to decrease the likelihood of bloodborne pathogens spreading. Once again, bloodborne pathogens are not to be feared, but rather, well understood so that better precautions are taken under a multitude of circumstances. Life under the out from under the strong hold of bloodborne pathogens is almost always preventable and in such situations where it could not have been a choice, there are a new and developing treatments

for hindering progression. So, be educated, make healthy lifestyle choices, and seek help when needed.

References

- AIDSVu (n.d.). Emory University, Rollins School of Public Health. Retrieved from <https://aidsvu.org/state/kentucky>
- Atler, M. J., (2007). Epidemiology of hepatitis C virus infection. *World Journal of Gastroenterology*, 13(17), 2436-2441.
- Bennett, J., (2015). Blood-borne pathogens: Further opportunities for “gold standard” nursing care. *HIV Nursing 2015*, (15), 1-2.
- Bureau of HIV, STD, and Hepatitis, (2017). Iowa Department of Public Health, Hepatitis C Virus: Baby Boomers and HCV. Retrieved from <http://idph.iowa.gov/Portals/1/userfiles/40/Fact%20Sheet%20HCV%20Among%20Baby%20Boomers-2016.pdf>
- Center for Disease Control and Prevention (2016). Overview of State Needle Safety Legislation. Retrieved from <https://www.cdc.gov/niosh/topics/bbp/ndl-law.html>
- Center for Disease Control and Prevention, (2017). HIV/AIDS: Prevention: How can I prevent getting HIV from anal or vaginal sex. Retrieved from https://www.cdc.gov/hiv/basics/prevention.html#condoms_prevent
- Center for Disease Control and Prevention, (2017). HIV/AIDS: Basics. Retrieved from <https://www.cdc.gov/hiv/basics/statistics.html>
- Center for Disease Control and Prevention, (2017). HIV/AIDS: HIV and the law. Retrieved from <https://www.cdc.gov/hiv/policies/law/states/exposure.html>
- Childs, T., (2013). Use of Double Gloving to Reduce Surgical Personnel’s Risk of Exposure to Bloodborne Pathogens: An Integrative Review. *ARON Journal*, (98)6, 585-593.
- Department of Health and Human Services, (2010). Center for Disease Control and Prevention, Division of Viral Hepatitis, Publication No. 21-1074. Retrieved from www.cdc.gov/hepatitis/hbv/pdfs/hepbatrisk.pdf
- Drug and Alcohol Rehab Asia, DARA Thailand, (2017). Risk of Disease with Drug Use. Retrieved from <http://alcoholrehab.com/drug-addiction/risk-of-disease-with-drug-use>
- Gostin, L., Lazzarini, Z., Jones, S., & Flaherty, K. (1997). Prevention of HIV/AIDS and Other Blood-borne Diseases Among Injection Drug Users A National Survey on the Regulation of Syringes and Needles. *JAMA*, 277(1), 53-62. doi:10.1001/jama.1997.03540250061033
- Lavanchy, D. (2004). Hepatitis B Virus Epidemiology, Disease Burden, Treatment, and Current and Emerging Prevention and Control Measures. *Journal of Viral Hepatitis*, April 2009, 11(2) 97-107. doi: 10.1046/j.1365-2893.2003.00487.x
- Lok, A. S. F., & McMahon, B. J. (2009). Chronic Hepatitis B: Update 2009. *Hepatology, AASLD Practice Guideline Update*, 50(3), 661. DOI: 10.1002/hep.23190

- National Institute of Diabetes and Digestive and Kidney Disease, (2017). U.S. Department of Health and Human Services, Hepatitis B. Retrieved from <https://www.niddk.nih.gov/health-information/liver-disease/viral-hepatitis/hepatitis-b>
- Occupational Safety and Health Administration, (n.d.). United States Department of Labor, *Bloodborne Pathogens and Needle Stick Prevention: Overview*, (n.p.). Retrieved from www.osha.gov/SLTC/bloodbornepathogens.
- Rumbwere Dube, B.N., Marshall, T.P., & Ryan, R.P., (2016). Predictors of human immunodeficiency virus (HIV) infection in primary care: a systematic review protocol. *Systematic Reviews Journal*, 5(158). DOI: 10.1186/s13643-016-0333-2.
- Simmonds, P., Holmes, E. C., Cha, T. A., Chan, S. W., McOmish, F., Irvine, B., Beall, E., Yap, P. L., Kolbert, J., & Urdea, M. S. (1993). Classifications of hepatitis c virus into six major genotypes and a series of subtypes by phylogenetic analysis of the NS-5 region. *Journal of General Virology*, 74 (2391-2399). doi:10.1099/0022-1317-74-11-2391.
- Stein, R., Song, W., Marano, M., Patel, H., Rao, S., & Morris, E., 2017. HIV Testing, Linkage to HIV Medical Care, and Interviews for Partner Services Among Youth – 61 Health Department Jurisdictions, United States, Puerto Rico, and the U.S. Virgin Islands, 2015. *Morbidity and Mortality Weekly Report*, 66(24), 629-635.
- Tanner, M., Bush, T., Nesheim, S., Weidle, P., Byrd, K., 2017. Retention in Medical Care Among Insured Children with Diagnosed HIV Infection- United States, 2010-2014. *Morbidity and Mortality Weekly Report*, 66(39), 1033-1038.
- The American National Red Cross, (2011). *Bloodborne Pathogens Training*, 1-3. Retrieved from http://www.redcross.org/images/MEDIA_CustomProductCatalog/m3240081_PreventingSpreadBloodbornePathogensFactandSkill.pdf.
- Thompson, G. & Shalit, P. (June 2014). HIV: Antiretroviral Therapy (ART), Healthwise. Retrieved from <http://www.webmd.com/hiv-aids/tc/hiv-highly-active-antiretroviral-therapy-haart-topic-overview>
- U.S. Department of Health and Human Services, HIV.gov, (2017). Overview: About HIV and AIDS: Who is at risk of HIV. Retrieved from <https://www.hiv.gov/hiv-basics/overview/about-hiv-and-aids/who-is-at-risk-for-hiv>
- U.S. Department of Health and Human Services, (2017). What are HIV and AIDS? Retrieved from <https://www.hiv.gov/hiv-basics/overview/about-hiv-and-aids/what-are-hiv-and-aids>
- Universal Precautions. (n.d.) *Farlex Partner Medical Dictionary*. (2012). Retrieved from <https://medical-dictionary.thefreedictionary.com/Universal+Precautions>

