Healthcare personnel are at risk for occupational exposure to bloodborne pathogens, including hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV). Exposures occur through needlesticks or cuts from other sharp instruments contaminated with an infected patient's blood or through contact of the eye, nose, mouth, or skin with a patient's blood. The purpose of this document is to provide guidance to you, the student, after exposure.

The School of Health, Wellness, & Public Safety at Central New Mexico Community College has a procedure in place a system for reporting exposures in order to quickly evaluate the risk of infection and to help provide you and your primary healthcare provider the information needed to help prevent infection. This is available on HWPS Community and in the HWPS Student Policy Handbook. It is the responsibility of the student to obtain post-exposure medical care.

What is considered to be a potential exposure to HIV, HBV or HCV?

For transmission of blood borne pathogens (HIV, HBV and HCV) to occur, an exposure must include both of the following:

1. **Infectious body fluid**
    - Blood, semen, vaginal fluids, amniotic fluids, breast milk, cerebrospinal fluid, pericardial fluid, peritoneal fluid, pleural fluid and synovial flood can transmit HIV, HBV and HCV. **Note**: saliva, vomitus, urine, feces, sweat, tears and respiratory secretions do not transmit HIV (unless visibly bloody). The risk of HBV and HCV transmission from non-bloody saliva is negligible.
2. **A portal of entry:** percutaneous (through the skin as in a needlestick), contact with a mucous membrane (eyes, nose, or mouth), or cutaneous contact with non-intact skin.

If only one of these factors are present, there is no risk of transmission and further evaluation is not required.

What is the risk of infection after an occupational exposure?

HBV: Healthcare personnel who have received hepatitis B vaccine and developed immunity to the virus are at virtually no risk for infection. For a susceptible person, the risk from a single needlestick or cut exposure to HBV-infected blood ranges from 6-30% and depends on the hepatitis B e antigen (HBeAg) status of the source individual. Hepatitis B surface antigen (HBsAg)-positive individuals who are HBeAg positive have more virus in their blood and are more likely to transmit HBV than those who are HBeAg negative. While there is a risk for HBV infection from exposures of mucous membranes or nonintact skin, there is no known risk for HBV infection from exposure to intact skin.

HCV: The average risk for infection after a needlestick or cut exposure to HCV infected blood is approximately 1.8%. The risk following a blood exposure to the eye, nose or mouth is unknown, but is believed to be very small; however, HCV infection from blood splash to the eye has been reported. There also has been a report of HCV transmission that may have resulted from exposure to nonintact skin, but no known risk from exposure to intact skin.

HIV:

- The average risk of HIV infection after a needlestick or cut exposure to HIV-infected blood is 0.3% (i.e., three-tenths of one percent, or about 1 in 300). Stated another way, 99.7% of needlestick/cut exposures do not lead to infection.
- The risk after exposure of the eye, nose, or mouth to HIV-infected blood is estimated to be, on average, 0.1% (1 in 1,000).
- The risk after exposure of non-intact skin to HIV-infected blood is estimated to be less than 0.1%. A small amount of blood on intact skin probably poses no risk at all. There have been no documented cases of HIV transmission due to an exposure involving a small amount of blood on intact skin (a few drops of blood on skin for a short period of time).

What kind of treatment is available to prevent infections with bloodborne pathogens?

HBV : Hepatitis B vaccine has been available since 1982 to prevent HBV infection. Note that CNM requires that healthcare and public safety students be vaccinated against hepatitis B. If you were previously vaccinated and you know you responded to the vaccination series (a positive titer is >10mIU/mL, but most do not know their titer), you are considered to have lifelong immunity and require no further testing or treatment.

If you have not been previously vaccinated, if you are not sure of your titer, or if you are unsure if you completed the HBV vaccination series, starting and completing the Hepatitis B vaccine series is effective in preventing HBV infection within 72 hours after an exposure. The vaccine is safe to receive during pregnancy.

HCV: There is no vaccine against hepatitis C and no treatment after an exposure that will prevent infection. Neither immune globulin nor antiviral therapy is recommended after exposure. For these reasons, following recommended infection control practices to prevent percutaneous injuries is imperative.

Direct viral testing with HCV RNA PCR viral load at 6 weeks, before HCV Ab seroconversion has occurred, allows for early identification of transmission and subsequent referral for early evaluation and potential HCV treatment. The rate of spontaneous clearance of HCV infection is about 25% in healthy persons. However, early diagnosis and treatment may increase HCV clearance to 90% or greater. HCV antibody testing should be performed at 4-6 months to rule out HCV infection.

HIV: There is no vaccine against HIV. Postexposure prophylaxis (PEP) is recommended for certain occupational exposures that pose a risk of transmission. However, for those exposures without risk of HIV infection, PEP is not recommended because the drugs used to prevent infection may have serious side effects. You should discuss the risks and side effects with your healthcare provider before starting PEP for HIV.

How are exposures to blood from an individual whose infection status is unknown handled?

HBV–HCV–HIV If the source individual cannot be identified or tested, decisions regarding follow-up should be based on the exposure risk and whether the source is likely to be infected with a bloodborne pathogen. CNM's post-exposure data collection tool is an important resource to help evaluate this risk.

What postexposure treatment is recommended?

HBV: If you have not been vaccinated or if you are unsure of your titer levels then hepatitis B vaccination is recommended for any exposure regardless of the source person's HBV status.

HCV: There is no postexposure treatment that will prevent HCV infection. Typically, direct viral testing with HCV RNA PCR viral load at 6 weeks post-exposure, before HCV antibody seroconversion has occurred, allows for early identification of transmission and subsequent referral for early evaluation and potential HCV treatment. The rate of spontaneous clearance of HCV infection is about 25% in healthy persons. However, early diagnosis and treatment may increase HCV clearance to 90% or greater.

HIV: If it has been determined that your risk for HIV exposure is indeterminate or high, you will be instructed to seek medical care from your primary care provider, the New Mexico Department of Health, or from an urgent care center within 24 hours.

You should share this resource with your practitioner:

The National Clinical Consultation Center through the University of California San Francisco and the Centers for Disease Control provides expert clinical advice on providing optimal care for post exposure prophylaxis. Online: http://nccc.ucsf.edu/ Phone: (888) 448-4911 9 a.m. – 2 a.m. EST, seven days a week.

How soon after exposure to a bloodborne pathogen should treatment start?

HBV: Postexposure immunization for those students whose immunity is not known should begin as soon as possible after exposure, preferably within 24 hours, and no later than 7 days.

HIV: Treatment should be started as soon as possible, preferably within hours as opposed to days, after the exposure. Although animal studies suggest that treatment is less effective when started more than 24-36 hours after exposure, the time frame after which no benefit is gained in humans is not known. Starting treatment after a longer period (e.g., 1 week) may be considered for exposures that represent an increased risk of transmission.

Can pregnant healthcare personnel take the drugs recommended for postexposure treatment?

HBV: Yes. Women who are pregnant or breast-feeding can receive the hepatitis B vaccine and/or HBIG. Pregnant women who are exposed to blood should be vaccinated against HBV infection, because infection during pregnancy can cause severe illness in the mother and a chronic infection in the newborn. The vaccine does not harm the fetus.

HIV: Pregnancy should not rule out the use of postexposure treatment when it is warranted. If you are pregnant you should understand what is known and not known regarding the potential benefits and risks associated with the use of antiviral drugs in order to make an informed decision about treatment.

What follow-up should be done after an exposure?

HBV: Because postexposure treatment is highly effective in preventing HBV infection, CDC does not recommend routine follow-up after treatment. However, any symptoms suggesting hepatitis (e.g., yellow eyes or skin, loss of appetite, nausea, vomiting, fever, stomach or joint pain, extreme tiredness) should be reported to your healthcare provider. If you receive hepatitis B vaccine, you should be tested 1-2 months after completing the vaccine series to determine if you have responded to the vaccine and are protected against HBV infection.

HCV: You should be tested for HCV antibody and liver enzyme levels (alanine aminotransferase or ALT) as soon as possible after the exposure (baseline) and at 4-6 months after the exposure. To check for infection earlier, you can be tested for the virus (HCV RNA) 4-6 weeks after the exposure. Report any symptoms suggesting hepatitis (mentioned above) to your healthcare provider.

HIV: You should be tested for HIV antibody as soon as possible after exposure (baseline) and periodically for at least 6 months after the exposure (e.g., at 6 weeks, 12 weeks, and 6 months). If you take antiviral drugs for postexposure treatment, you should be checked for drug toxicity by having a complete blood count and kidney and liver function tests just before starting treatment and 2 weeks after starting treatment. You should report any sudden or severe flu-like illness that occurs during the follow-up period, especially if it involves fever, rash, muscle aches, tiredness, malaise, or swollen glands. Any of these may suggest HIV infection, drug reaction, or other medical conditions. You should contact the healthcare provider managing your exposure if you have any questions or problems during the follow-up period.

What precautions should be taken during the follow-up period?

HBV: If you are exposed to HBV and receive postexposure treatment, it is unlikely that you will become infected and pass the infection on to others. No precautions are recommended.

HCV: Because the risk of becoming infected and passing the infection on to others after an exposure to HCV is low, no precautions are recommended.

HIV: During the follow-up period, especially the first 6-12 weeks when most infected persons are expected to show signs of infection, you should follow recommendations for preventing transmission of HIV. These include not donating blood, semen, or organs and not having sexual intercourse. If you choose to have sexual intercourse, using a condom consistently and correctly may reduce the risk of HIV transmission. In addition, women should consider not breast-feeding infants during the follow-up period to prevent the possibility of exposing their infants to HIV that may be in breast milk.

REFERENCES

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National Clinical Consultation Center (2015). PEP Guidelines. Retrieved from http://nccc.ucsf.edu/clinical-resources/pep-resources/pep-guidelines/