**PRACTICUM DOCUMENT 2: Information about working near infectious materials**

**If your practicum is in an outpatient or inpatient medical setting you are required to read this section and ask medical personnel at your practicum site if you have further questions.**

**The hazards associated with occupational exposure to blood and other potentially infectious materials for healthcare workers include contracting hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV).**

Exposures occur through needle sticks 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.

Important factors that influence the overall risk for occupational exposures to blood borne pathogens include the number of infected individuals in the patient population and the type and number of blood contacts. Most exposures do not result in infection.

**RISK OF INFECTION AFTER EXPOSURE**

**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 needle stick or cut exposure to HBV-infected blood ranges from 6-30% and depends on the hepatitis Be antigen (HBeAg) status of the source individual.
* While there is a risk for HBV infection from exposures of mucous membranes or non-intact skin, there is no known risk for HBV infection from exposure to intact skin.

**HCV**

* The average risk for infection after a needle stick 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 non-intact skin, but no known risk from exposure to intact skin.

**HIV**

* The average risk of HIV infection after a needle stick 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 needle stick/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).

**For Further Information:**

**HBV and HCV** For additional information about hepatitis B and hepatitis C, call the hepatitis information line at 1-888-4-HEPCDC (1-888–443-7232) or visit CDC’s hepatitis website at [www.cdc.gov/hepatitis](http://www.cdc.gov/hepatitis).

**HIV** Information specialists who staff the CDC National AIDS Hotline (1-800-

 342-2437) can answer questions or provide information on HIV infection and

 AIDS and the resources available in your area. The HIV/AIDS Treatment

 Information Service (1-800-448-0440) can also be contacted for information on

the clinical treatment of HIV/AIDS.

**HBV-HCV-HIV P**EPline (the National Clinicians’ Post exposure Prophylaxis Hotline) is a 24-hour, 7-day-a-week consultation service for clinicians managing occupational

 exposures. PEPline can be contacted by phone at (888) 448-4911 (toll free) or on the Internet at <http://pepline.ucsf.edu/pepline>.

**Protective measures to be taken to minimize the risk of occupational exposure to blood borne pathogens consist of following “universal precautions.”**

Online training for Universal Precautions can be found at the American Red Cross website: <http://www.redcrossonlinetraining.org/Distance/Default.aspx>

"Universal precautions," as defined by CDC, are a set of precautions designed to prevent transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other blood-borne pathogens when providing first aid or health care. Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for HIV, HBV and other blood-borne pathogens.

Universal precautions apply to blood, other body fluids containing visible blood, semen, and vaginal secretions. Universal precautions also apply to tissues and to the following fluids: cerebrospinal, synovial, pleural, peritoneal, pericardial, and amniotic fluids. Universal precautions do not apply to feces, nasal secretions, sputum, sweat, tears, urine, and vomit unless they contain visible blood. Universal precautions do not apply to saliva except when visibly contaminated with blood or in the dental setting where blood contamination of saliva is predictable.

**Universal precautions involve the use of protective barriers such as gloves, gowns, aprons, masks, or protective eyewear, which can reduce the risk of exposure of the health care worker's skin or mucous membranes to potentially infective materials. In addition, under universal precautions, it is recommended that all health care workers take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices.**

Pregnant health care workers are not known to be at greater risk of contracting HIV infection than are health care workers who are not pregnant; however, if a health care worker develops HIV infection during pregnancy, the infant is at risk of infection resulting from perinatal transmission. Because of this risk, pregnant health care workers should be especially familiar with, and strictly adhere to, precautions to minimize the risk of HIV transmission.

**WRITTEN GUIDELINES: UNIVERSAL PRECAUTIONS**

Universal precautions are discussed in the following documents:

1. [CDC. Recommendations for prevention of HIV transmission in health-care settings](http://www.cdc.gov/mmwr/preview/mmwrhtml/00023587.htm). MMWR 1987;36(suppl no. 2S).
2. [CDC. Update: Universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other blood-borne pathogens in health-care settings](http://www.cdc.gov/mmwr/preview/mmwrhtml/00000039.htm). MMWR 1988;37:377-388.
3. [CDC. Guidelines for prevention of transmission of human immunodeficiency virus and hepatitis B virus to health-care and public-safety workers](http://wonder.cdc.gov/wonder/prevguid/p0000114/p0000114.asp). MMWR 1989;38(S-6):1-36.

These three documents may be obtained by calling the AIDS Hotline at 1-800-342-2437 or the National AIDS Information Clearinghouse at 1-800-458-5231.

In addition, the Occupational Safety and Health Administration (OSHA) has published a standard on "blood-borne pathogens." For information about this document, call 202-219-7157.

**GLOVING, GOWNING, MASKING, AND OTHER PROTECTIVE BARRIERS AS PART OF UNIVERSAL PRECAUTIONS**

All health care workers should routinely use appropriate barrier precautions to prevent skin and mucous membrane exposure during contact with any patient's blood or body fluids that require universal precautions.

Recommendations for the use of gloves are presented in detail in the Morbidity and Mortality Weekly Report dated June 24, 1988, which is available by calling the National AIDS Information Hotline at 1-800-342-2437 or the National AIDS Information Clearinghouse at 1-800-458-5231.

Gloves should be worn:

* for touching blood and body fluids requiring universal precautions, mucous membranes, or nonintact skin of all patients, and
* for handling items or surfaces soiled with blood or body fluids to which universal precautions apply.

Gloves should be changed after contact with each patient. Hands and other skin surfaces should be washed immediately or as soon as patient safety permits if contaminated with blood or body fluids requiring universal precautions. Hands should be washed immediately after gloves are removed. Gloves should reduce the incidence of blood contamination of hands during phlebotomy, but they cannot prevent penetrating injuries caused by needles or other sharp instruments. Gloves should always be available to health care workers who wish to use them for phlebotomy. In addition, the following general guidelines apply:

1. Use gloves for performing phlebotomy when the health care worker has cuts, scratches, or other breaks in his/her skin.
2. Use gloves in situations where the health care worker judges that hand contamination with blood may occur, e.g., when performing phlebotomy on an uncooperative patient.
3. Use gloves for performing finger and/or heel sticks on infants and children.
4. Use gloves when persons are receiving training in phlebotomy.

The Center for Devices and Radiological Health, Food and Drug Administration (FDA), has responsibility for regulating the medical glove industry. For more information about selection of gloves, call FDA at 301-443-8913.

Masks and protective eyewear or face shields should be worn by health care workers to prevent exposure of mucous membranes of the mouth, nose, and eyes during procedures that are likely to generate droplets of blood or body fluids requiring universal precautions. Gowns or aprons should be worn during procedures that are likely to generate splashes of blood or body fluids requiring universal precautions.

All health care workers should take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices during procedures; when cleaning used instruments; during disposal of used needles; and when handling sharp instruments after procedures. To prevent needle stick injuries, needles should not be recapped by hand, purposely bent or broken by hand, removed from disposable syringes, or otherwise manipulated by hand. After they are used, disposable syringes and needles, scalpel blades, and other sharp items should be placed in puncture-resistant containers for disposal. The puncture-resistant containers should be located as close as practical to the use area. All reusable needles should be placed in a puncture-resistant container for transport to the reprocessing area.

General infection control practices should further minimize the already minute risk for salivary transmission of HIV. These infection control practices include the use of gloves for digital examination of mucous membranes and endotracheal suctioning, handwashing after exposure to saliva, and minimizing the need for emergency mouth-to-mouth resuscitation by making mouthpieces and other ventilation devices available for use in areas where the need for resuscitation is predictable.

Although universal precautions do not apply to human breast milk, gloves may be worn by health care workers in situations where exposures to breast milk might be frequent, e.g., in breast milk banking.

**Appropriate actions to take in an emergency involving exposure to blood and other potentially infectious materials:**

IF AN EXPOSURE OCCURS

**What should I do if I am exposed to the blood of a patient?**

1. Immediately following an exposure to blood:

 Wash needle sticks and cuts with soap and water

 Flush splashes to the nose, mouth, or skin with water

 Irrigate eyes with clean water, saline, or sterile irrigants

*No scientific evidence shows that using antiseptics or squeezing the wound will reduce the risk of transmission of a blood-borne pathogen. Using a caustic agent such as bleach is not recommended.*

2. Report the exposure to the department (e.g., occupational health, infection control) responsible for managing exposures. Prompt reporting is essential because, in some cases, post-exposure treatment may be recommended and it should be started as soon as possible. Discuss the possible risks of acquiring HBV, HCV, and HIV and the need for post-exposure treatment with the provider managing your exposure. You should have already received hepatitis B vaccine, which is extremely safe and effective in preventing HBV infection. (p 2)

Centers for Disease Control. (2008). *Exposure to Blood: What Healthcare Personnel Need to Know*. Retrieved from http://www.cdc.gov/ncidod/dhqp/pdf/bbp/Exp\_to\_Blood.pdf

**Reasons the employee should participate in hepatitis B vaccination and post-exposure evaluation and follow-up.**

Reasons to participate in Hepatitis B Vaccination

The CDC recommends healthcare workers receive the full series of the vaccine

HBV is efficiently transmitted by percutaneous or mucous membrane exposure to infectious blood or body fluids that contain blood. The incubation period from the time of exposure to onset of symptoms is 6 weeks to 6 months. HBV is found in highest concentrations in blood and in lower concentrations in other body fluids (e.g., semen, vaginal secretions, and wound exudates).

* The word "**hepatitis**" means inflammation of the liver and also refers to a group of viral infections that affect the liver. The most common types are Hepatitis A, Hepatitis B, and Hepatitis C.
* Viral hepatitis is the leading cause of liver cancer and the most common reason for liver transplantation.
* In the United States, an estimated 1.2 million Americans are living with chronic Hepatitis B... Many do not know they are infected. Each year an estimated 25,000 persons become infected with Hepatitis A; 43,000 with Hepatitis B, and 17,000 with Hepatitis C.

<http://www.cdc.gov/hepatitis/HBV/index.htm>

*What is the risk of infection after an occupational exposure?*

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 needle stick 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. The annual number of occupational infections has decreased 95% since hepatitis B vaccine became available in 1982, from >10,000 in 1983 to <400 in 2001 (CDC, unpublished data).

Centers for Disease Control. (2008). *Exposure to Blood: What Healthcare Personnel Need to Know*. Retrieved from http://www.cdc.gov/ncidod/dhqp/pdf/bbp/Exp\_to\_Blood.pdf

Reasons to participate in post-exposure evaluation and follow-up.

* After exposure to Hepatitis B virus (HBV), appropriate and timely prophylaxis can **prevent HBV infection** and subsequent development of chronic infection or liver disease.
* Acute infection: No medication available; best addressed through supportive treatment
* 15%–25% of chronically infected persons develop chronic liver disease, including cirrhosis, liver failure, or liver cancer
* Estimated 3,000 persons in the United States die from HBV-related illness per year

Centers for Disease Control. (2010). *The ABCs of Hepatitis.* Publication No. 21-1076

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