Information from the
Centers for Disease Control and Prevention
National Center for Infectious Diseases
Divison of Healthcare Quality Promotion and
Division of Viral Hepatitis

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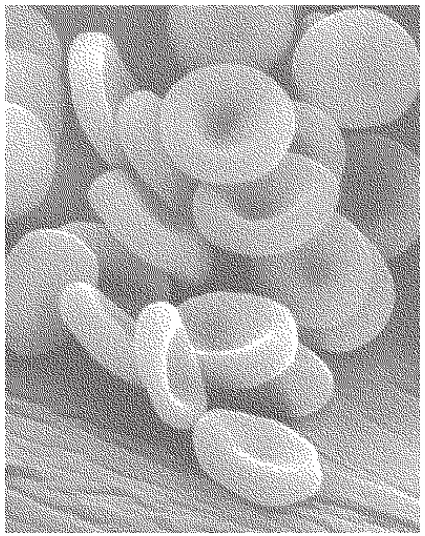
Exposure to Blood

What Healthcare Personnel Need to Know



Department of Health & Human Services

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OTHER SOURCES OF 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.

Any reaction or adverse health event after getting hepatitis B vaccine sould be reported to your healthcare provider. The Vaccine Adverse Event Reporting System (1-800-822-7967) receives reports from healthcare providers and others about vaccine side effects.

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. For free copies of printed material on HIV infection and AIDS, please call or write the CDC National Prevention Information Network, P.O. Box 6003, Rockville, MD 20849-6003, telephone 1-800-458-5231, Internet address www.cdcnpin.org. Additional information about occupational exposures to bloodborne pathogens is available on CDC's Division of Healthcare Quality Promotion's website at www.cdc.gov/ncidod/hip or by calling 1-800-893-0485 and on CDC's National Institute of Occupational Safety and Health's website at www.cdc.gov/niosh or call 1-800-35 NIOSH (1-800-356-4674).

HBV-HCV-HIV

PEPline (the National Clinicians' Postexposure Prophylaxis Hotline) is a 24-hour, 7-day-a-week consultation service for clinicians managing occupational exposures. This service is supported by the Health Resources and Services Administration Ryan White CARE Act and the AIDS Education and Training Centers and CDC. PEPline can be contacted by phone at (888) 448-4911 (toll free) or on the Internet at http://pepline.ucsf.edu/pepline.

Cover Photo: Human Red Blood Cells,

Exposure to Blood
What Healthcare Personnel Need to Know

OCCUPATIONAL EXPOSURES TO BLOOD

Introduction

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. Important factors that influence the overall risk for occupational exposures to bloodborne 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. Following a specific exposure, the risk of infection may vary with factors such as these:

- The pathogen involved
- The type of exposure
- The amount of blood involved in the exposure
- The amount of virus in the patient's blood at the time of exposure

Your employer should have in place a system for reporting exposures in order to quickly evaluate the risk of infection, inform you about treatments available to help prevent infection, monitor you for side effects of treatments, and determine if infection occurs. This may involve testing your blood and that of the source patient and offering appropriate postexposure treatment.

How can occupational exposures be prevented?

Many needlesticks and other cuts can be prevented by using safer techniques (for example, not recapping needles by hand), disposing of used needles in appropriate sharps disposal containers, and using medical devices with safety features designed to prevent injuries. Using appropriate barriers such as gloves, eye and face protection, or gowns when contact with blood is expected can prevent many exposures to the eyes, nose, mouth, or skin.

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 needlesticks 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 bloodborne 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, postexposure 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 postexposure 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.

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 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 HlV-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 HlV-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).

How many healthcare personnel have been infected with blood-borne pathogens?

HBV

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).

HCV

There are no exact estimates on the number of healthcare personnel occupationally infected with HCV. However, studies have shown that 1% of hospital healthcare personnel have evidence of HCV infection (about 3% of the U.S. population has evidence of infection). The number of these workers who may have been infected through an occupational exposure is unknown.

HIV

As of December 2001, CDC had received reports of 57 documented cases and 138 possible cases of occupationally acquired HIV infection among healthcare personnel in the United States since reporting began in 1985.

TREATMENT FOR THE EXPOSURE

Is vaccine or treatment available to prevent infections with blood-borne pathogens?

HBV

As mentioned above, hepatitis B vaccine has been available since 1982 to prevent HBV infection. All healthcare personnel who have a reasonable chance of exposure to blood or body fluids should receive hepatitis B vaccine. Vaccination ideally should occur during the healthcare worker's training period. Workers should be tested 1-2 months after the vaccine series is complete to make sure that vaccination has provided immunity to HBV infection. Hepatitis B immune globulin (HBIG) alone or in combination with vaccine (if not previously vaccinated) is effective in preventing HBV infection after an exposure. The decision to begin treatment is based on several factors, such as:

- Whether the source individual is positive for hepatitis B surface antigen
- Whether you have been vaccinated
- Whether the vaccine provided you immunity

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.

HIV

There is no vaccine against HIV. However, results from a small number of studies suggest that the use of some antiretroviral drugs after certain occupational exposures may reduce the chance of HIV transmission. 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. Follow-up testing should be available to all personnel who are concerned about possible infection through occupational exposure.

What specific drugs are recommended for postexposure treatment?

HBV

If you have not been vaccinated, then hepatitis B vaccination is recommended for any exposure regardless of the source person's HBV status. HBIG and/or hepatitis B vaccine may be recommended depending on the source person's infection status, your vaccination status and, if vaccinated, your response to the vaccine.

HCV

There is no postexposure treatment that will prevent HCV infection.

HIV

The Public Health Service recommends a 4-week course of a combination of either two antiretroviral drugs for most HIV exposures, or three antiretroviral drugs for exposures that may pose a greater risk for transmitting HIV (such as those involving a larger volume of blood with a larger amount of HIV or a concern about drug-resistant HIV). Differences in side effects associated with the use of these drugs may influence which drugs are selected in a specific situation. These recommendations are intended to provide guidance to clinicians and may be modified on a case-by-case basis. Determining which drugs and how many drugs to use or when to change a treatment regimen is largely a matter of judgment. Whenever possible, consulting an expert with experience in the use of antiviral drugs is advised, especially if a recommended drug is not available, if the source patient's virus is likely to be resistant to one or more recommended drugs, or if the drugs are poorly tolerated.

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

HBV

Postexposure treatment 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.

Has the FDA approved these drugs to prevent bloodborne virus infection following an occupational exposure?

HBV

Yes. Both hepatitis B vaccine and HBIG are approved for this use.

HIV

No. The FDA has approved these drugs only for the treatment of existing HIV infection, but not as a treatment to prevent infection. However, physicians may prescribe any approved drug when, in their professional judgment, the use of the drug is warranted.

What is known about the safety and side effects of these drugs?

HBV

Hepatitis B vaccine and HBIG are very safe. There is no information that the vaccine causes any chronic illnesses. Most illnesses reported after a hepatitis B vaccination are related to other causes and not the vaccine. However, you should report to your healthcare provider any unusual reaction after a hepatitis B vaccination.

HIV

All of the antiviral drugs for treatment of HIV have been associated with side effects. The most common side effects include upset stomach (nausea, vomiting, diarrhea), tiredness, or headache. The few serious side effects that have been reported in healthcare personnel using combinations of antiviral drugs after exposure have included kidney stones, hepatitis, and suppressed blood cell production. Protease inhibitors (e.g., indinavir and nelfinavir) may interact with other medicines and cause serious side effects and should not be taken in combination with certain other drugs, such as non-sedating antihistamines, e.g., Claritin®. If you need to take antiviral drugs for an HIV exposure, it is important to tell the healthcare provider managing your exposure about any medications you are currently taking.

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.

FOLLOW-UP AFTER AN EXPOSURE

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.

PREVENTION OF OCCUPATIONAL INFECTIONS WITH HBV, HCV, OR HIV

Hepatitis B virus is largely preventable through vaccination. For HBV, HCV, and HIV, however, preventing occupational exposures to blood can prevent occupational infections with HBV, HCV, and HIV. This includes using appropriate barriers such as gown, gloves and eye protection as appropriate, safely handling needles and other sharp instruments, and using devices with safety features.