

Infection Control

Frequently Asked Questions

Bloodborne Pathogens – Occupational Exposure

What constitutes an occupational exposure in dentistry?

An exposure can be defined as a percutaneous injury (e.g., needlestick or cut with a sharp object) or contact of mucous membrane or nonintact skin (e.g., exposed skin that is chapped, abraded, or with dermatitis) with blood, saliva, tissue, or other body fluids that are potentially infectious. Exposure incidents might place dental health care personnel at risk for hepatitis B virus (HBV), hepatitis C virus (HCV), or human immunodeficiency virus (HIV) infection, and therefore should be evaluated immediately following treatment of the exposure site by a qualified health care professional.¹

When determining the need for postexposure evaluation and follow-up in occupational settings, what body fluids are potentially infectious?

When evaluating occupational exposures to fluids that might contain hepatitis B virus (HBV), hepatitis C virus (HCV), or human immunodeficiency virus (HIV), health care workers should consider blood and all body fluids containing visible blood as infectious, and cerebral spinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, and amniotic fluid as potentially infectious. Feces, nasal secretions, saliva, sputum, sweat, tears, urine, and vomitus are not considered potentially infectious unless they contain blood. However, during dental procedures it is predictable that saliva will become contaminated with blood. If blood is not visible, it is likely that only very small quantities of blood are present and that the risk for transmission of HBV, HCV, or HIV is extremely small. Despite this small risk of transmission, a qualified health care professional¹ should evaluate any occupational exposure² to saliva in dental settings, regardless of the presence of visible blood.

What is the risk of infection after an occupational exposure?

Hepatitis B Virus (HBV)

Health care workers who have received hepatitis B vaccine and have developed immunity to the virus are at virtually no risk for infection. For an unvaccinated person, the risk from a single needlestick or a cut exposure to HBV-infected blood ranges from 6%–30% and depends on the hepatitis B e antigen (HBeAg) status of the source individual. Individuals who are both hepatitis B surface antigen (HBsAg) positive and HBeAg positive have more virus in their blood and are more likely to transmit HBV.

Hepatitis C Virus (HCV)

Based on limited studies, the estimated risk for infection after a needlestick or cut exposure to

HCV-infected blood is approximately 1.8%. The risk following a blood splash is unknown but is believed to be very small; however, HCV infection from such an exposure has been reported.

Human Immunodeficiency Virus (HIV)

- The average risk for HIV infection after a needlestick or cut exposure to HIV-infected blood is 0.3% (about 1 in 300). Stated another way, 99.7% of needlestick/cut exposures to HIV-contaminated blood 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 the 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). The risk may be higher if the skin is damaged (for example, by a recent cut), if the contact involves a large area of skin, or if the contact is prolonged.

What should be done following an occupational exposure?

Wounds and skin sites that have been in contact with blood or body fluids should be washed with soap and water; mucous membranes should be flushed with water. Immediate evaluation must be performed by a qualified health care professional.¹ Health care providers who evaluate exposed dental health care professionals should be

- Selected before dental health care professionals are placed at risk of exposure.
- Experienced in providing antiretroviral therapy.
- Familiar with the unique nature of dental injuries so they can provide appropriate guidance on the need for antiretroviral prophylaxis.

Employers should follow all federal (including the Occupational Safety and Health Administration (OSHA)) and state requirements for recording and reporting occupational injuries and exposures. The following information should be included in the exposure report, recorded in the exposed person's confidential medical record, and made available to qualified health care professionals:¹

- Date and time of exposure.
- Details of the procedure being performed, including where and how the exposure occurred, whether the exposure involved a sharp device, the type of device, whether there was visible blood on the device, and how and when during its handling the exposure occurred.
- Details of the exposure, including the type and amount of fluid or material and the severity of the exposure. For a percutaneous injury, details would include the depth of the wound, the gauge of the needle, and whether fluid was injected; for a skin or mucous membrane exposure they would include the estimated volume of material, the duration of contact, and the condition of the skin (e.g., chapped, abraded, or intact).
- Details about the exposure source —whether the patient was infected with hepatitis B

- virus (HBV) and his or her hepatitis B e antigen (HBeAg) status; hepatitis C virus (HCV); or human immunodeficiency virus (HIV); and, if the source was infected with HIV, the stage of disease, history of antiretroviral therapy, and viral load, if known. If this information is not known from the medical record, then the source patient should be asked to obtain serologic testing for HBV, HCV, and HIV.
- Details about the exposed person (e.g., hepatitis B vaccination and vaccine-response status).
 - Details about counseling, post exposure management, and follow-up.

What factors must qualified health care professionals consider when assessing the need for follow-up of occupational exposures?

The evaluation must include the following factors to determine the need for further follow-up:

Type of exposure

- Percutaneous injury (e.g., depth, extent)
- Mucous membrane exposure
- Nonintact skin exposure
- Bites resulting in blood exposure to either person involved

Type and amount of fluid/tissue

- Blood
- Fluids containing blood

Infectious status of source

- Presence of hepatitis B surface antigen (HBsAg) and hepatitis B e antigen (HBeAg)
- Presence of hepatitis C virus (HCV) antibody
- Presence of human immunodeficiency virus (HIV) antibody

Susceptibility of exposed person

- Hepatitis B vaccine and vaccine response status
- HBV, HCV, or HIV immune status

After conducting this initial evaluation of the occupational exposure, a qualified health care professional must decide whether to conduct further follow-up on an individual basis using all of the information obtained.

What are some measures to reduce the risk of blood contact?

Avoiding occupational exposures to blood is the primary way to prevent transmission of HBV, HCV, and HIV in health care settings. Methods used to reduce such exposures in dental settings include engineering and work practice controls and the use of personal protective

equipment (PPE).

Engineering controls isolate or remove the bloodborne pathogens hazard from the workplace. These controls are frequently technology-based and often incorporate safer designs of instruments and devices. Examples include sharps disposal containers, rubber dams, and self-sheathing anesthetic needles. Whenever possible, engineering controls should be used as the primary method to reduce exposures to bloodborne pathogens following skin penetration with sharp instruments or needles.

Work practice controls are behavior-based and are intended to reduce the risk of blood exposure by changing the manner in which a task is performed. Examples include using the "scoop" technique to recap an anesthetic needle, removing burs before placing the hand piece in the dental unit, and restricting the use of fingers during suturing and when administering anesthesia.

Personal protective equipment consists of specialized clothing or equipment worn to protect against hazards. Examples include gloves, masks, protective eyewear with side shields, and gowns to prevent skin and mucous membrane exposures.

[Back to Top](#)

Do I have to use dental safety devices?

Mandated by the Needlestick and Prevention Act, changes to OSHA's bloodborne pathogen standard were published on January 18, 2001, and took effect April 18, 2001. The revisions clarify the need for employers to select safer needle devices as they become available and to involve employees in identifying and choosing the devices. Additional information about developing a safety program and identifying and evaluating safer dental devices can be found at the following Web sites:

- Forms for screening and evaluating safer dental devices: http://www.cdc.gov/OralHealth/infection_control/forms.htm
- Current list of available safer dental devices: <http://www.osap.org>*
- State legislation on needlestick safety: <http://www.cdc.gov/niosh/topics/bbp/>

Selected References and Additional Resources

Beltrami EM. The risk and prevention of occupational human immunodeficiency virus infection. *Seminars in Infection Control* 2001;1:2-18.

CDC. *Exposure to Blood: What Health Care Workers Need to Know*. Available at: http://www.cdc.gov/ncidod/hip/Blood/Exp_to_Blood.pdf (PDF 363K). Accessed April 2004.

CDC. Guidelines for prevention of transmission of human immunodeficiency virus and

hepatitis B virus to health care and public-safety workers. *MMWR* 1989;38(S-6):1 36.

CDC. Update: Universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other bloodborne pathogens in health care settings. *MMWR* 1988;37:377 382, 387 388.

CDC. National Institute for Occupational Safety and Health. *NIOSH Alert: Preventing needlestick injuries in health care settings*. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, CDC, National Institute for Occupational Safety and Health, 1999.

CDC. Updated U.S. Public Health Service guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations for postexposure prophylaxis. *MMWR* 2001;50(No.RR-11).

Chiarello LA, Bartley JB. Prevention of blood exposure in health care personnel. *Seminars in Infection Control* 2001;1:30 43.

Footnotes

1. A qualified health care professional is any health care provider who can provide counseling and perform all medical evaluations and procedures in accordance with the most current recommendations of the U.S. Public Health Service, including postexposure chemotherapeutic prophylaxis when indicated.
2. See response to question, "What constitutes an occupational exposure in dentistry?"