



Chapter 4

PROTECTING YOURSELF FROM INFECTIOUS DISEASES

Healthcare providers are at risk for contracting serious infectious diseases. Although the human immunodeficiency virus (HIV) is often the most feared, the hepatitis B virus (HBV) and hepatitis C virus (HCV) are actually much more contagious than HIV, because a smaller inoculum can cause infection.

Healthcare workers who are inexperienced at technical procedures and find themselves having to treat open wounds and perform invasive procedures are especially at risk for two important reasons. First, treatment of an open wound almost always necessitates exposure to blood and body fluids. Blood and body fluids represent the primary mode of transmission of these contagious agents. Second, the treatment of open wounds and the performance of even simple procedures (for example, suturing) involves the use of sharp instruments. Inexperience on the part of the healthcare provider is a major risk factor contributing to an accidental needlestick or other traumatic injury during such procedures.

Scope of the Problem

These statistics are presented not to scare you, but to emphasize that the risk is genuine.

Human Immunodeficiency Virus

World Prevalence: Over 47 million people worldwide have been infected with HIV since the start of the epidemic. In 1998, HIV caused over 2 million deaths. In some countries in Africa, 1 in 4 people is infected with HIV. Ninety-five percent of cases occur in the developing world.

Prevalence in the U.S. Approximately 1 in 200 people carries HIV.

Hepatitis B Virus

World Prevalence. There are over 350 million chronic carriers of HBV worldwide. In developing nations, 8–15% of the population are chronic carriers. This percentage drops to less than 5% in developed nations. Five to ten percent of chronically infected people will develop chronic liver disease that may lead to death.

Prevalence in the U.S. Approximately 1 million people are chronically infected with HBV.

Hepatitis C Virus

World Prevalence. Three percent of the world's population is infected with HCV. There are more than 170 million chronic carriers of HCV. About 50–70% of infected people will develop chronic liver disease. HCV infection is the leading disease necessitating liver transplantation.

Prevalence in the U.S. Approximately 4 million people are chronically infected with HCV.

Delta Hepatitis Virus

The delta hepatitis virus (HDV) primarily affects patients infected with HBV. A patient infected with both HBV and HDV has an increased risk for the development of fulminant hepatitis compared with a patient infected with HBV alone (the risk doubles to 20%). About 70–80% of people infected with HBV and HDV develop chronic hepatitis.

Prevalence in the U.S. Unknown

Simple Precautions that Make a Difference

- **Wash your hands before and after examining every patient.** This is the single most important way to prevent the spread of infectious diseases.
- **Wear gloves.** Gloves should be worn whenever you anticipate contact with mucous membranes, open wounds, or body substances (e.g., urine, feces, blood). Also wear gloves when handling items soiled with blood or body fluids or performing any type of invasive procedure. Do not go from patient to patient wearing the same pair of gloves. Gloves are not a substitute for proper hand washing. After removing your gloves, remember to wash your hands.
- **Double-glove whenever possible during procedures involving sharp instruments.** Double gloves may feel uncomfortable at first, but you will get used to them. Try wearing a glove a half size larger next to your skin, and wear your regular size over the larger glove.

- **Wear goggles.** Eye protection is always advisable during procedures. Get your own pair, and keep them in your pocket. You will be amazed at how much material accumulates on the lenses, even when you are not aware that any material has been sprayed. The goggles used for racket sports are quite comfortable and often very useful. When you wear a mask over your mouth, the goggles may fog up because exhaled air escapes from under the mask around the edges of your nose. To prevent your lenses from fogging, tape the mask to your cheeks and to the bridge of your nose to prevent air escape.
- **Get vaccinated against HBV.** All healthcare providers should be immunized against HBV. The vaccine is 95% effective in preventing infection. The current vaccine is completely artificial, i.e., no human products are part of the vaccine. There is *no* chance of contracting HBV, HCV, or HIV from the vaccine. The vaccine is administered as a series of three intramuscular injections. The second dose is given 1 month after the first injection, and the third dose is given 6 months after the first injection.
- **Observe proper use and disposal of all sharp instruments.** Needles for injection should not be recapped by hand. Accidents often occur during manual recapping. Keep the cap on your tray, and slide the needle back into the cap when you have finished using it. Do not attempt to bend needles or other sharp objects. Use your instruments when placing sutures—*not your fingers!* Suturing is often difficult for the novice, but get in the habit of using only instruments to hold and reposition the needle. With practice, this technique becomes easier. Do not leave needles or other sharp instruments lying around. Always place them in a container marked “sharp instruments” after use.
- **Adequately sterilize all reusable materials.** This practice is vital to protect healthcare providers and their patients from serious infectious diseases. *Never* reuse needles or syringes without properly sterilizing them.
- **Keep all countertops and other surfaces clean.** It is important to regularly clean all surfaces that may have become contaminated by blood or other body fluids. HBV can survive for at least 1 week in dried blood on various surfaces. A disinfectant made of dilute bleach should be used for regular cleaning.

Postexposure Treatment

Exposure to potentially infectious blood or body fluids includes needlesticks, splashing of fluids in the face or eyes, and contact with body fluids or blood through an open wound on your skin. Although intact skin is usually a good protective barrier, irritated or chapped skin (for example, from cold weather) can be penetrated by some viruses. If, despite following all of the above recommendations, you are exposed to potentially infectious blood or body fluids, certain steps can be taken to decrease your risk for becoming ill.

- **If you are exposed to HBV and have not been previously vaccinated:** Hepatitis B immunoglobulin (HBIG) should be given (5.0 ml intramuscularly). HBIG is most effective when administered within 24 hours of a needlestick, but some protection is still afforded if it is given in the first few days after exposure. You also should begin the HBV vaccination regimen.
- **If you are exposed to HCV:** Unfortunately, there is no way to prevent infection after HCV exposure. However, close observation is warranted, and at the first sign of hepatitis, interferon therapy should be instituted. Although early interferon therapy, before any signs or symptoms of hepatitis have developed, does not prevent illness, once signs and symptoms become apparent, interferon may prevent serious illness.
- **If you are exposed to HIV:** If you have access to drugs used to treat HIV infection, a short course of medication is often recommended after a significant exposure. Usually, exposure to infected urine does not warrant treatment. Recommendations for treatment usually are related to the patient's HIV titer and to the healthcare worker's degree of exposure. For example, a hollow needlestick from a patient with a high HIV titer definitely warrants postexposure treatment—optimally, a combination of zidovudine, 200 mg 3 times/day; lamivudine, 150 mg 2 times/day, and indinavir, 800 mg 3 times/day. All are given orally.

Bibliography

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