

Virtual Mentor

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Clinical Pearl

Management of Needlestick Injuries in the Health Care Setting

by Josiah Penalver

Needlesticks are a common occurrence in the health care profession. It is estimated that 600 000 to 800 000 needlestick injuries occur per year in the United States [1]. Of these, many, if not most, go unreported [2]. In response to the risk of exposure, institutions have focused on primary prevention as a means of reducing the incidence of needlesticks and thereby decreasing the number of bloodborne pathogen transmissions. Needlestick injuries still occur, however, and it is important that individuals in the health care field become well informed about the exposure risks and educated regarding the appropriate response.

What are the primary pathogens transmitted?

1. *Human Immunodeficiency Virus (HIV)*: The average risk of seroconversion after a needlestick injury from a confirmed HIV source is approximately 0.3 percent without post-exposure therapy [1]. Certain factors contribute to elevated risk [3]:

- Increased depth of the puncture wound
- Visible blood on the needle
- Needle used in the vein or artery of the patient
- Patient with terminal HIV as source of the fluid

2. *Hepatitis B Virus (HBV)*: The risk of acquiring hepatitis secondary to HBV percutaneous exposure varies based on the serological status of the patient. In the worst case scenario, if the patient has active replication of the virus (indicated by HBeAg-positive blood [4]) then the risk of developing clinical hepatitis is as high as 31 percent [3]. When the patient has HBsAg-positive blood but is HBeAg-negative (indicating a less infective state), the risk is significantly lower, about 1 to 6 percent [3].

3. *Hepatitis C Virus (HCV)*: The risk of HCV seroconversion after a needlestick injury from a patient infected with HCV is approximately 1.8 percent [1]. Unfortunately, there is little evidence to support postexposure treatment as a means to decrease the risk of infection.

Role of Vaccination

Of these 3 infections, vaccination is available only for HBV. In the 1970s, the risk of acquiring HBV was 10 times greater in health care workers than in the general population [3]. This risk has significantly declined, due in part to an aggressive vaccination campaign geared toward hospital staff [3].

Facts about the vaccine [5]:

- A series of 3 shots made from HBsAg is administered.
- Vaccination response can be confirmed by assessing for anti-HBs 2-3 months after completion of the series.
- Efficacy is approximately 95 percent in healthy adults.
- Protection lasts at least 10 years after vaccination, but may last much longer [6].
- Currently, no booster is recommended.

What protocol should be followed after any needlestick?

First, *do not panic*. Protocols are in place to minimize the risk of infection after exposure. Second, do not ignore the exposure. Acting within outlined timeframes can lead to a significant decrease in the transmission rate of certain infections. The following measures also should be taken [1]:

- The site should be immediately washed with soap and water.
- The incident should be reported and an exposure report sheet completed.
- The exposure should be assessed (type of fluid, type of needle, amount of blood on the needle, etc).
- The exposure source should be evaluated:
 - a. HIV, HBV, and HCV status of the patient;
 - b. Consent and testing of the patient for these diseases if the status is unknown;
 - c. Likelihood of infection based on the community served by the hospital if the patient is not available to be tested.
- Appropriate management of any positive exposure is necessary

Virus-specific Post-exposure Management

1. *HIV*: Use of post-exposure prophylaxis can help to reduce the risk of contracting HIV. Maximal benefit can be obtained by initiating treatment within hours of exposure. Guidelines include the following [1]:

- Start post-exposure prophylaxis as soon as possible.
- Reevaluate the exposed individual within 72 hours, particularly focusing on new information regarding the source and the exposure.
- If the source is determined to be HIV-negative, post-exposure prophylaxis can be discontinued.
- If the source is determined to be HIV-positive, continue treatment for 4 weeks if tolerated.
- All workers exposed to HIV should undergo HIV antibody testing at 6 weeks, 12 weeks, and 6 months.

A few additional considerations regarding HIV exposure management:

There is the possibility of toxicity with antiretrovirals, so use should be restricted to exposures in which reasonable risk of transmission is present.

- 2-drug therapy (with 2 nucleoside analogues) is recommended, although 3-drug therapy may be warranted under certain circumstances (ie, a source with a high viral load or known drug resistance).
- One should inform the treating physician about pregnancy status and current medications because these can influence the selection of a treatment regimen.
2. *HBV*: The treatment after exposure varies based on the vaccination status of the exposed individual and the HBV status of the patient [1]:
- Regardless of the status of the patient, if an individual suffers a needlestick and is unvaccinated, the vaccination series should be initiated.
- If an individual has been vaccinated and has a documented response to the vaccine, then no treatment is required after an exposure.
- If the vaccination status of the exposed individual is unknown, he or she should be tested for anti-HBs before deciding on treatment.
3. *HCV*: No treatment has been shown to prevent infection for workers exposed to HCV. Recommendations center on following workers after the injury and monitoring for HCV RNA in the serum. Recommendations include [7]:
- Begin testing for HCV antibodies, HCV RNA levels, and alanine aminotransferase (ALT) levels immediately after the event.
- Repeat testing 2-8 weeks later.
- If infection occurs, the health care worker should be referred to a specialist for management.

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Josiah Penalver is a fourth-year medical student at the University of Washington. He plans to pursue a specialty in pediatrics.

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