



Needlestick Injuries Among Health Care Providers

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Abstract:

Needlestick injuries are a frequent occurrence in hospital settings. Needlesticks can also happen when people aren't careful when disposing of used needles or other medical equipment in an unsanitary or inadequate sharps container. Occupational needlestick injuries are more likely to occur when workers do not have access to or choose not to use available personal protective equipment.

Introduction

“PREVENTION IS BETTER THAN CURE”

“After touching blood, tissue, or other physiological fluids, a needle or other sharp object may cause a needle stick injury, also known as a percutaneous injury, percutaneous exposure incident, or sharps injury.”^[1] Despite the fact that the immediate symptoms of a needle stick injury are often not very severe, these injuries may lead to the spread of blood-borne illnesses. Those who are exposed are thus more prone to get illnesses such as the human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C (HCV). More than twenty-five blood-borne viruses have been associated to needle stick injuries among healthcare and laboratory personnel.^[2] In addition to needle stick injuries, these viruses may also be transmitted when blood or other bodily fluids enter the eyes or other mucous membranes. In the United States, needlestick injuries account for more than 80 percent of all percutaneous exposures.^[1] Law enforcement personnel, tattoo artists, laborers, food handlers, and farming workers are also at a greater risk for needle stick injuries.^{[3] [4]}

Recognition of the unique occupational hazard presented by needle stick injuries and the development of effective measures to reduce the mostly avoidable occupational risk prompted legislative regulation in the United States, resulting in a drop in needlestick injuries among healthcare professionals.^{[5] [6]}



Needlestick injuries happen often in healthcare settings. Injuries can also happen when the needle cap is put back on or when devices are thrown away in the wrong way into a sharps container that is too full or not in the right place. Needlestick injuries at work are more likely if workers don't have access to the right personal protective equipment or don't use the equipment they are given.^[2] Injuries from needlesticks may also occur when needles are handed from one person to another, put into a needle driver, or tied off with the needle still attached. Needlestick injuries occur more often during night shifts^[7] and among inexperienced individuals. Being exhausted, having a lot to accomplish, working shifts, feeling under a great deal of pressure, or having a high-risk perception may all increase the likelihood of being stuck by a needle. During surgery, a surgical needle or other sharp device might mistakenly penetrate a patient's glove or skin;^[8] needle stick injuries can transfer bacteria, protozoa, viruses, and prions;^[6] the largest risk is for contracting hepatitis B, hepatitis C, and HIV. According to the World Health Organization, "needle stick injuries were responsible for 66,000 instances of hepatitis B, 16,000 cases of hepatitis C, and 1,000 cases of HIV in the year 2000." Health care professionals are more prone to get blood-borne infections from a needle stick injury in regions with a greater prevalence of these diseases among the general population.^[8]

The greatest risk of transmission is associated with hepatitis B, with 10 percent of exposed personnel experiencing seroconversion and 10 percent developing symptoms. While the risk of hepatitis B transmission has reduced as a result of increasing vaccination rates among the general population and healthcare professionals,^[17] the risk remains greater among non-healthcare workers owing to their lower HBV vaccination rate. While previous, smaller-scale research reported a transmission rate of 1.8% for hepatitis C^[14], more recent, larger-scale studies have revealed a transmission rate of 0.5%, which is far lower.^[15] The risk of HIV infection after percutaneous exposure to HIV-infected material in a hospital environment is 3%.^[2] After injuries caused by hollow-bore needles, deep penetration, visible blood on the needle, a needle located in a deep artery or vein, or biomedical equipment contaminated with blood from a terminally ill patient, blood-borne illnesses are more likely to be acquired.^[16] Knowledge about disease transmission or PEP does not aid in this regard.^[18]

Some affected individuals report increased anxiety throughout subsequent testing; however, this and other psychological effects often subside once testing is complete. Some persons who suffer needle stick injuries may develop long-term mental health issues including PTSD.^[19]

When a sterile needle is used to treat an injury (i.e., no bodily fluids were exposed), the risk of infection is low. However, per the site's occupational safety policy, employees are often required to file a report.



After a needle stick injury, it may be possible to decrease the risk of infection by taking certain precautions. HIV, an acute hepatitis panel “(HAV IgM, HBsAg, HB core IgM, and HCV)”, and HB surface antibody testing are required for baseline studies. The infectiousness of the source must be determined unless this is already known. Unless the source is known to be negative for HBV, HCV, and HIV, ^[24] post-exposure prophylaxis (PEP) should be initiated ideally within an hour of the injury. ^[13] Hepatitis B: The estimated seroconversion risk among those exposed to hepatitis B (e antigen-positive) is 37-62%, which is significantly higher than the risk associated with other bloodborne infections. The hepatitis B vaccination is the cornerstone of PEP ^[8]; hepatitis B immunoglobulin is sometimes recommended for additional protection. ^[21] The likelihood of developing hepatitis C antibodies varies between 0.34 and 0.74 percent. As stated in ^[7], Hepatitis C PEP does not require immunoglobulin or antiviral medication. According to ^[20], there is a 0.3% possibility of spreading HIV via a skin puncture. Within three days of exposure, ^[6] the affected person can begin antiretroviral treatment for PEP. ^[13] When the HIV status of the blood donor is known, the CDC recommends a three-drug regimen; those exposed to blood with a low viral load or otherwise low risk can use a two-drug protocol. ^[16] Counselling and HIV testing are included in the follow-up of all exposed individuals for at least six months after exposure. Such tests are performed at baseline, 6 weeks, 12 weeks, 6 months, and longer in some cases, such as HCV co-infection. ^[13]

A Vacutainer is used to collect the blood. After using a needle, it is covered with a pink safety cap. Those in the medical field who are at the highest risk for needle stick injuries should be the primary target of preventative efforts. The first is switching to instruments that have been modified to reduce the risk of sharps injuries, such as safety-engineered scalpels and tapered-point or blunt surgical needles. ^[8] Second, implement precautionary measures, such as the hands-free method, into your daily routine. ^[22] Personal protection equipment upgrades, such as wearing two sets of gloves, are the third line of defence against an attack. ^[11] Better implementation may be achieved with the help of legislation, education, and training for all potentially affected health care employees. ^[23]

Nurses represent a significant proportion of the population at risk, yet they are exposed to danger far less frequently than physicians. There are a variety of "safety-engineered devices" available, including retractable needles, needle shields/sheaths, needle-free IV kits, and blunt or valve ends on IV connections. Les nurses are less likely than the average population to utilise protective gloves. ^[24]

CONCLUSION

A needle stick injury is the penetration of the skin by a hypodermic needle or other sharp object that has been in contact with blood, tissue or other body fluids before the exposure. It is a percutaneous piercing wound typically set by a needle point, but possibly also by other sharp instrument or objects.



Commonly encountered by people handling needles in the medical setting, such injuries are an occupational hazard in the medical community. These events are of concerns because of the risk to transmit blood borne diseases through the passage of the hepatitis B virus, the hepatitis C virus, and the human immunodeficiency virus, the virus that cause AIDS.

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