

Needlestick Injuries Among Healthcare Workers Administering COVID-19 Vaccinations in the United States

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Abstract

As mass COVID-19 vaccination programs roll out across the country, we are potentially faced with compromising workers' health for the sake of the broader public health, as it relates to occupational exposure to contaminated needles and syringes. We have the opportunity to provide recommendations that advance protection of workers through the industrial hygiene hierarchy of controls, especially in light of the twentieth anniversary of the Needlestick Safety and Prevention Act. Specifically, greater focus on institutional controls that can dictate the safety culture and climate of institutions that roll out COVID-19 vaccination programs, while maintaining careful focus on preventing sharps injuries and blood exposure. In addition, we provide suggestions for the role that engineering controls, such as devices with sharps injury prevention features play in protecting workers from exposure to bloodborne pathogens, as well as the importance of ongoing injury incident surveillance.

Keywords

COVID-19, SARS-CoV-2, needlesticks, sharps injuries, healthcare worker safety, OSHA bloodborne pathogens

Introduction

Healthcare workers (HCWs) are at risk of needlestick injuries (NIs) from contaminated needles and sharps.¹ HCWs may perform job tasks such as vaccination and mass vaccination, blood and specimen collection, skin injections, and intravenous administration of therapies, among other situations that can cause needlesticks. In the United States, under the Occupational Safety and Health Act, employers have primary responsibility for providing safe and healthy workplaces.² The Occupational Safety and Health Administration (OSHA) Bloodborne Pathogens Standard has been in effect since 1991, but because of high incidence of ongoing needlesticks reported by employers, in 2000, the U.S. Congress passed into law the “Needlestick Safety and Prevention Act.”³ The Act required OSHA to update its standard to include more emphasis on the use of engineering controls—specifically, devices with sharps injury prevention features—for a higher degree of protection. It also included the requirement for more robust injury incident surveillance via the Sharps Injury Log. All workplaces that have employees with occupational exposure to blood or other potentially infectious materials have the minimum requirements to comply with all

applicable elements of the Bloodborne Pathogens, Respiratory Protection, and Personal Protective Equipment Standards. The OSHA Bloodborne Pathogens Standard includes precautions such as an employer site-specific exposure control plan which includes worker training. Part of the worker training requires an explanation of appropriate engineering controls, work practices, and personal protective equipment as it relates to preventing or reducing bloodborne pathogen exposure.⁴

Ongoing Occupational Risk

Despite those regulatory efforts, more than twenty years ago, to address NIs among HCWs, the risks still remain. A meta-analysis by Brouillette et al. found that nurses had a 5.2 percent weighted average risk of a sharp injury

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during a one-year span while working in a healthcare setting.⁵ While literature pertaining to needlesticks in mass vaccination programs are limited pertaining to COVID-19, Williams et al. found a substantial increase of needlestick rates during mass vaccination programs in comparison to routine vaccination clinics in Denver, Colorado during the 2009 influenza A (H1N1) pandemic.⁶ The higher rates of needlesticks may have been contributed by the higher rate of vaccinations administered by the HCWs, the use of nonhospital settings, and lack of training.⁶ During the COVID-19 pandemic, HCWs are facing working conditions such as long hours, staff shortages, and organizational inexperience that may increase the risk of NIs as they continue to care for others and participate in the delivery of the COVID-19 vaccine.⁷

HCWs, as frontline workers, are at nearly twelve times greater risk of COVID-19 infection than the general population in the United States.⁸ In a study by Hawkins et al., COVID-19 deaths in the state of Massachusetts from March 1 to July 31, 2020 were most reported in healthcare support occupations.⁹ Burdened with heightened risk of infection during the COVID-19 pandemic, HCWs are additionally facing staff shortages, workplace violence, emotional and psychological toll, stigma and fear of infecting others, inadequate personal protection and lack of hierarchy of controls, and unclear protocols and practices.⁷

It is unclear how many workers, employers, and worksites are needed to accomplish COVID-19 mass vaccination. To gather a perspective, in New York state, large-scale facilities were opened, including using sports stadiums and community-based sites which aim to conduct 3000 vaccinations per day over an eight-week period.¹⁰ In addition, smaller nonclinical settings may include pharmacies, schools, and churches in administering the COVID-19 vaccination. Staff for vaccination sites should be trained on administering the vaccine and on storage and handling.¹¹

Impact of Mass Coronavirus Vaccination Programs

In response to the COVID-19 pandemic, there is a need to vaccinate a significant majority of the population. A high demand will be placed on HCWs to deliver those vaccinations. According to national surveillance data, injuries from hypodermic syringes used for skin injection are already the most prevalent type of needlestick.^{1,12,13} The underlying difficult working circumstances for HCWs will likely further increase the risk of NIs. There is a need for workplace safety and health training and raising awareness for HCWs on preventing NIs.¹⁴

The Bloodborne Pathogen Standard mandates employers to provide workplace-specific health and safety training to workers.⁴

Nurses, for example, may be at increased risk of NIs when their work hours are variable, have lower confidence in their skills, and feel an urgency to complete work assignments without proper control measures.¹⁵ Changes in organizational policies and practice may help alleviate difficult working conditions for HCWs, such as reducing the feeling of urgency and variable work hours. Organizational-level change can occur through collective bargaining agreements in unionized work places, as union leadership can take actions toward negotiating safer work places.¹⁶ However, negotiating contract language or developing labor/management agreement about developing necessary needlestick prevention protocols takes time that may not be available in the rollout of mass COVID-19 vaccinations. For those work places without unions, the change in organizational policies may be even less likely without management support, nor the mechanism to negotiate collective bargaining agreements.

Advancing the Hierarchy of Controls

Work place safety and health training may be used to raise the awareness and skill level of workers, such as HCWs facing potential NIs.^{17,18} The use of other administrative controls, such as policies to address staff shortages which may lead to feelings of urgency and variable work hours, may further address the difficult challenges HCWs are facing, not just during COVID-19 vaccinations, but in their daily working activities. Considering the barriers to implementing policy changes, enhanced worker training is an immediate response within the hierarchy of controls that can increase awareness and skill level needed for safer work places.

OSHA generally, and the Bloodborne Pathogen Standard specifically, requires employers to use the hierarchy of controls to protect workers. The mandatory California OSHA Aerosol Transmissible Diseases standard includes requirements for following the hierarchy of controls.¹⁹ The state of Virginia passed the first-in-nation OSHA COVID-19 work place emergency standard in July 2020,²⁰ which became a permanent standard on 13 January 2021. Oregon has proposed to become the second such state to pass a COVID-19 infectious disease standard.²¹ On 21 January 2021, President Biden ordered OSHA to consider a federal COVID-19 Emergency Temporary Standard,²² and OSHA has released stronger worker protection guidelines for COVID-19.²³ These standards and guidelines that follow the hierarchy of controls may hopefully lead to

Table 1. Institutional Controls.

Institutional controls	
Inputs and mechanisms	Intended outcomes
<ul style="list-style-type: none"> - Full-facility engagement of leadership, management, supervisors, union or labor representation, and staff workers - Identifying organizational gaps in safety and health and hierarchy of controls - Develop worker training programs - Dialogue toward policies, plans, and programs toward safer work places - Practice and incorporate facility-wide safety measures into standard business activities - Procurement of safer medical devices, including those with sharps injury prevention features - Facility-wide exposure assessments - Utilizing the Sharps Injury Log to direct prevention efforts 	<ul style="list-style-type: none"> - Safer culture within the work place as it relates to occupational safety and health and infection prevention and control - Increased skill level, confidence, and competency of workers to improve outcomes and prevent injury and exposure - Targeted workplace education and training that is effective in raising awareness and skill level - Labor-management relationship fostered and strengthened - Effective policies, plans, and programs that address organizational gaps in safety and health and hierarchy of controls - Use of safer medical devices to prevent sharps injuries and blood exposures - Robust injury incident surveillance and nonpunitive reporting of sharps injuries

Inputs and mechanisms on using institutional controls and the intended outcomes.

improved safety culture and climate regarding blood-borne pathogen and other biological exposures.

Annual training and education for exposed workers needs to be provided as a forum for engagement and discussion related to new and existing needlesticks can help prepare workers. Needlestick and sharps injury prevention training to develop strategies related to innovative devices can further help HCWs safely use and dispose of needlesticks.¹² With the hierarchy of controls, when hazard elimination and substitution are not possible, using engineering and administrative controls is recommended next before the last line of defense—personal protective equipment. Beyond the traditional hierarchy of controls, “institutional controls” may help address sharps injury prevention at the highest level.¹² Institutional controls are focused on a culture of safety and full-facility collaboration to support workers with exposure potential to infectious diseases and work-related injuries, such as COVID-19 and NIs (Table 1). In fact, experts in sharps safety and needlestick prevention posit that institutional controls should sit at the very top of the hierarchy of controls, as they have “the biggest influences on the rest of the program as a whole.”¹²

Establishing health and safety programs that incorporate the hierarchy of controls, workplace training, and institutional controls can be a successful strategy for preventing HCW NIs during efforts to vaccinate the population against COVID-19. Developing and implementing health and safety programs in this way may address longstanding healthcare work place health and safety issues that have been exacerbated by the COVID-19 pandemic.

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Amber Mitchell is the International Safety Center's President and Executive Director and distributes the Exposure Prevention Information Network (EPINet®) to healthcare to measure occupational exposures to sharps injuries and other blood and body fluid exposures. Her career has been focused on public health and occupational safety and health related to preventing infectious disease. She has worked in the uniformed services, public, private, and academic sectors and began her career as the first OSHA National Bloodborne Pathogens Coordinator and received several Secretary of Labor Excellence awards for her work on bioterrorism and public preparedness.