National Institute of Environmental Health Sciences
Worker Training Program

Injection Safety for COVID-19 Vaccinators & Vaccine Administrators

Preventing Needlesticks and Blood Exposures

Introduction

COVID-19 vaccines play a critical role in history, saving countless lives. Widespread participation in the vaccination program is needed for it to be fully effective. Delivering COVID-19 vaccines to millions of Americans will be challenging and worker safety and health during the vaccination campaign must be a top priority.

Given the need to vaccinate a majority of the population, hundreds of millions of syringes and needles will be used, increasing the risk of needlestick and other sharps injuries and blood exposure.

The Occupational Safety and Health Administration (OSHA) Bloodborne Pathogens Standard (29 CFR 1910.1030) requires employers to protect workers from needlesticks. Strategies to protect vaccinators should be incorporated into other standard bloodborne pathogen and COVID-19 programs. These include adequate engineering and administrative controls, including ventilation and safe distancing, as well as personal protective equipment (PPE), such as respirators, face coverings, eye protection, and gloves. People who are getting vaccinated should wear face coverings as a source control.

Needlestick injuries (NSIs) can transmit bloodborne pathogens, including hepatitis B, hepatitis C, and HIV. According to surveillance data, NSIs occur most frequently with disposable syringes in the hospital setting.[1,2,3] NSIs also occur in other settings including nursing homes, clinics, emergency care services, and private homes.[4] Underreporting of NSIs is well documented.[5,6] There is limited information about the occurrence of NSIs during mass vaccination clinics because the scale of this type of program is unprecedented.

Mass vaccination clinics may pose greater risks for NSIs to vaccinators, especially when performed in non-traditional settings and in high volumes. In one study, NSIs were 4.9 times higher during a tri-county pandemic influenza A (H1N1) mass vaccination clinic compared to other vaccination clinics. Inexperienced vaccinators had the highest rate of NSIs.[7]

The following factors are associated with NSIs:

- Distraction, including noise and crowded spaces.
- Difficulty removing the cap of the needle or recapping.
- Lack of an ideal setting.
- The patient jumps, jars, or moves.
- Inappropriate technique, pinching skin with opposite hand.
- Inappropriate selection of needle size or type.
- Lack of sharps injury prevention feature on syringe or needle.
- Improper disposal or placing used syringe on surface.
- Fatigue after immunizing for seven consecutive workdays.[7,8,9,10]

Sharps Safety and Safe Injection

Safe injection practices should always be in place. Employers must comply with OSHA's Bloodborne Pathogens Standard, 29 CFR 1910.1030 found at https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1030.

The standard requires, but is not limited to, the following:

- Assess the risk of NSIs and blood exposures with frontline vaccinators at each vaccination location and document the assessment in the Exposure Control Plan.
- Determination of exposure through a hazard assessment that evaluates the work environment and work practices conducted before the vaccination program is launched.
- Engineering controls, ensuring that devices with sharps injury prevention features are evaluated, selected, and used.
- Safe work practices are being used, such as immediate disposal of used needles and other sharps and prohibiting recapping.
- Vaccinators are wearing appropriate gloves and other PPE based on the hazard assessment.
- The Exposure Control Plan is available for all workers to access at any time during their shift.

Safer Medical Devices, Work Practices and Sharps Containers

- Vaccinators must be trained on the vaccination process including dilution and administration of the vaccine. Training should include device review and hands-on practice with devices (syringes and needles) that will be used in the clinic. All training should occur in advance of performing vaccinations.
- Devices with engineered sharps injury protection features can significantly reduce the risk of a NSI and are critical to a successful vaccine clinic program. All vaccinators should be trained in the proper activation of the sharps injury prevention feature prior to use.
- Puncture resistant sharps containers must be located as close to the point of use as possible to discard all used syringe and needle devices. The container should be labeled, color-coded, secured to prevent tipping over, and closed and replaced when three-fourths full.

The National Institute for Occupational Safety and Health (NIOSH) provides valuable information on sharps containers available here: https://www.cdc.gov/niosh/docs/97-111/default.html.

Portable sharps container

Injury Protocols, Reporting, and Recordkeeping

- Organizations should ensure that all vaccinators and other personnel with potential exposures are familiar with and follow organizational policies and procedures for reporting a NSI. These procedures must be documented in the organization's Exposure Control Plan.
- OSHA requires employers to record all NSIs on a Sharps Injury Log. At a minimum, a log needs to include the following:

Date	Case Report Number	Type of Device	Brand Name of Device	Department or Work Area Where the Injury Occurred	Brief Description of How the Injury Occurred

- Additional helpful information that may be recorded on the log include occupation and the type of sharps injury feature on the device, if any.
- Planning must include site-specific procedures to access medical follow-up for vaccinators who experience a NSI. Employers should arrange for post-exposure care as soon as possible after the NSI, ideally immediately following the incident. The Centers for Disease Control and Prevention (CDC) states that post-exposure prophylaxis (PEP) for exposure to HIV should begin as soon as possible and no later than 72 hours after the incident.[11, 12]
- The follow-up includes a medical assessment of the injury, source patient testing, counseling, administration of PEP (when warranted), and continued post-exposure follow-up by the medical provider at intervals designated by the U.S. Public Health Service. Guidance for occupational exposure is available from CDC:
  - HBV: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6210a1.htm.
  - HCV: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5409a1.htm.
  - HIV: https://www.jstor.org/stable/10.1086/672271#metadata_info_tab_contents.
- NSIs are considered work-related in most state and federal workers' compensation systems. Organizations sponsoring vaccination programs should be prepared to help injured vaccinators navigate these complex systems that pay for medical follow-up, treatment, and lost wages.
- If volunteers or contractors are mobilized as vaccinators, the sponsoring organization should clearly state that these workers are included in post-exposure protocols, including follow-up medical care.

Other Safety and Health Concerns

- Administrators should schedule break periods for vaccinators. This will provide time for rest, stretching or adjustment of vaccination set-ups to help prevent strains and sprains that can result from awkward or static postures while performing vaccinations. Fatigue due to long hours of repetitive work can increase the risk of injury and medical errors.
- Vaccinators should be provided with proper PPE including a fit-tested, properly sized N95 or equivalent respirator. Surgical masks will not protect vaccinators or people being vaccinated. During accelerating community spread, a higher level of protection may be warranted. Additional appropriate PPE includes eye protection, a face shield or goggles, and gloves.
- Site-specific precautions should remain in effect during the vaccination program including mask wearing for non-vaccinators and those receiving the vaccine, physical distancing, increased ventilation and filtration, and worker and patient surveillance for COVID-19 symptoms.
- Administrators should actively solicit input and evaluation from vaccinators to improve practices and address concerns, and document this input in the Exposure Control Plan.
- Administrators should ensure that vaccinators and other personnel know their safety and health rights and how to file a confidential complaint. Information is available from OSHA at https://www.osha.gov/workers/file-complaint.

References

1. International Safety Center, Exposure Prevention Information Network (EPINet) Summary Reports. EPINet Report for Needlestick and Sharp Object Injuries. https://internationalsafetycenter.org/exposure-reports/
2. International Safety Center. Moving the Sharps Safety in Healthcare Agenda Forward in the United States: 2020 Consensus Statement and Call to Action. 20th Anniversary of the Needlestick Safety and Prevention Act. https://internationalsafetycenter.org/wp-content/uploads/2020/12/Moving_The_Sharps_Safety_In_Healthcare_Agenda_Forward_In_The_US.pdf
3. Massachusetts Department of Public Health. Sharps Injuries among Hospital Workers in Massachusetts: Findings from the Massachusetts Sharps Injury Surveillance System, 2016, 2017, 2018. September 2020. https://www.mass.gov/doc/sharps-injuries-among-hospital-workers-in-massachusetts-2016-2017-2018/download
4. Centers for Disease Control and Prevention. Workbook for designing, implementing, and evaluating a sharps injury prevention program. 2008. Available from: http://www.cdc.gov/sharpssafety/resources.html
5. Voide C, Darling KEA, Kenfak-Foguena A, Erard V, Cavassini M, Lazor-Blanchet C. Underreporting of needlestick and sharps injuries among healthcare workers in a Swiss university hospital. Swiss Med Wkly. 2012 Feb 10; 142:w13523. doi: 10.4414/smw.2012.13523.
6. Tandberg D, Stewart KK, Doezema D. Under-reporting of contaminated needlestick injuries in emergency health care workers. Ann Emerg Med. 1991 Jan; 20(1):66-70. doi: 10.1016/s0196-0644(05)81122-9.
7. Williams NJ, Ghosh TS, Vogt RL. Needlestick injury surveillance during mass vaccination clinics: lessons learned and why more is needed--Tri-County (Denver Metropolitan) region, Colorado, 2009. Am J Infect Control, 2012 Oct; 40(8):768-70. doi: 10.1016/j.ajic.2011.09.014. Epub 2012 Feb 3
8. Mitchell A, Parker G. Preventing needlestick and sharps injuries. American Nurse Today. 2015. https://www.myamericannurse.com/preventing-needlestick-sharps-injuries/
9. Mitchell A, Parker G. Preventing injuries from disposable syringes. American Nurse Today. 2015. https://www.myamericannurse.com/preventing-injuries-disposable-syringes/
10. Abraham E, Middleton D. Needlestick Injuries During a Mass Vaccination Campaign. Can J Public Health. 1997 Jan;88(1):38-39. doi: 10.1007/BF03403856
11. Kuhar DT, Henderson DK, Struble KA, Heneine W, Thomas V, Cheever LW, Gomaa A, Panlilio AL; US Public Health Service Working Group. Updated US Public Health Service guidelines for the management of occupational exposures to human immunodeficiency virus and recommendations for postexposure prophylaxis. Infect Control Hosp Epidemiol. 2013 Sep;34(9):875-92. doi: 10.1086/672271. Erratum in: Infect Control Hosp Epidemiol. 2013 Nov;34(11):1238.
12. National Institutes of Health. HIV Prevention. Post-Exposure Prophylaxis (PEP). https://hivinfo.nih.gov/understanding-hiv/fact-sheets/post-exposure-prophylaxis-pep

Resources

- **CDC:** https://www.cdc.gov/vaccines/covid-19/index.html
- **U.S. Food and Drug Administration, COVID-19 Vaccines:** https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-vaccines
- **OSHA Bloodborne Pathogens and Needlestick Prevention:** https://www.osha.gov/bloodborne-pathogens
- **NIOSH, Selecting, Evaluating, and Using Sharps Disposal Containers:** https://www.cdc.gov/niosh/docs/97-111/default.html
- **NIOSH Stop Sticks Campaign:** https://www.cdc.gov/niosh/stopsticks/default.html
- **U.S. Department of Veterans Affairs (VA), COVID-19 Vaccines at VA:** https://www.va.gov/health-care/covid-19-vaccine/
- **General Best Practice Guidelines for Immunization: Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP):** https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/administration.html
- **Free 4-Part Series Webinar, Continuing Education Course, Preventing Occupational Exposure to Bloodborne Pathogens in Healthcare:** https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-education-and-research-center-for-occupational-safety-and-health/ce/preventing-occupational-exposure-bloodborne-pathogens-healthcare
- **International Safety Center:** https://internationalsafetycenter.org/resources/

This publication was made possible by contract number 75N96020F00179 from the National Institute of Environmental Health Sciences (NIEHS), NIH. | v2, March 2021