Patient Safety: Percutaneous Sharp Injuries: Primary Prevention

From the AANEM Quality and Patient Safety Committee

Percutaneous sharp injuries, including needlestick injuries, are inherent risks for many healthcare workers. While the rate of blood-born pathogen seroconversion has decreased over the past 50 years, there remains the added stress following a sharps injury, as well as both direct and indirect costs to the physician. EDX physicians should prioritize primary prevention strategies to decrease the risk of sustaining sharps injuries.

An experienced EDX physician is performing needle EMG of the pronator teres in a 33-year-old female patient without significant past medical history presenting with new right arm weakness. A resident walks into the exam room during the procedure to ask a question and the physician turns away from the patient to address the resident. The patient sneezes and pulls her arm away causing the physician to stick themself in the hand with the EMG needle.

Question: Which of the following factors correlates with a decreased risk of blood-born pathogen seroconversion with a percutaneous sharp injury?

A. Higher viral load of patient
B. Increased depth of injury
C. Use of gloves during procedure
D. Recapping the needle

Answer: C) Use of gloves during procedure

Explanation: The CDC estimates 385,000 percutaneous sharp injuries occur among healthcare workers (HCW) each year. Factors that influence the likelihood of seroconversion following sharps injury include viral load of the patient, immunocompromised state of healthcare worker, depth of injury, and use of gloves by the HCW. Of the 20 blood-borne pathogens identified, HBV has the highest risk of seroconversion following sharps injury due to its high concentration of viral particles. Although seroconversion is estimated to be up to 62% in unvaccinated HCW, the risk for seroconversion is nearly eliminated after full vaccination. Seroconversion following a sharps injury is 0.3% from an HIV infected source and 0.2% from an HCV infected source. A 2008 survey distributed to members of AANEM indicated that 64% of EDX physicians had experienced a percutaneous sharp injury while performing needle EMG and 14% of those indicated that the source patient had HIV, HBV, or HCV. Fortunately, percutaneous sharp

injuries during electromyography are lower risk in nature. EMG needles are smaller gauge and are solid bore in design, which both protect against HCW seroconversion. 73% of the respondents in the above study reported to always wear gloves during needle EMG. The AANEM recommends that gloves be worn when performing needle EMG. Recapping of needles should be avoided as far as possible. If recapping is necessary, it should be performed through the use of a mechanical device, or a 1-handed technique is preferred over a 2-handed technique. Used needles should be placed in appropriate containers as soon as the procedure is finished and disposed of according to Occupational Safety and Health Administration (OSHA) requirements.

Sources:

Cardo DM, Culver DH, Ciesielski CA, et al. A case-control study of HIV seroconversion in health care workers after percutaneous exposure. Centers for Disease Control and Prevention Needlestick Surveillance Group. *N Engl J Med*. 1997;337(21):1485-1490. doi:10.1056/NEJM199711203372101

Egro FM, Nwaiwu CA, Smith S, Harper JD, Spiess AM. Seroconversion rates among health care workers exposed to hepatitis C virus-contaminated body fluids: The University of Pittsburgh 13-year experience. *Am J Infect Control*. 2017;45(9):1001-1005. doi:10.1016/j.ajic.2017.03.011

Mateen FJ, Grant IA, Sorenson EJ. Needlestick injuries among electromyographers. *Muscle Nerve*. 2008;38(6):1541-1545. doi:10.1002/mus.21118

Panlilio AL, Orelien JG, Srivastava PU, Jagger J, Cohn RD, Carco DM, the NaSH Surveillance Group; the EPINet Data Sharing Network. Estimate of the annual number of percutaneous injuries among hospital-based healthcare workers in the United States, 1997- 1998. *Infect Control Hosp Epidemiol* 2004; 25(7):556-62.

Werner BG, Grady GF. Accidental hepatitis-B-surface-antigen-positive inoculations. Use of e antigen to estimate infectivity. *Ann Intern Med*. 1982;97(3):367-369. doi:10.7326/0003-4819-97-3-367

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