

CONCISE COMMUNICATION

Needlestick Injuries among Employees at a Nationwide Retail Pharmacy Chain, 2000–2011

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We reviewed a nationwide retail pharmacy chain's centralized needlestick injury reports. From 2000 to 2011, 33 needlestick injuries were reported by 31 different pharmacy locations and were likely preventable. The annual incidence of needlestick injuries ranged from 0 to 3.62 per 100,000 vaccinations and ranged from 0 to 5.65 per 1,000 immunizing pharmacists.

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Influenza vaccinations are increasingly taking place in non-medical settings. By June 2009, all 50 states allowed pharmacists to administer influenza vaccinations to adults.¹ During the 2010–2011 influenza season, 18.4% of adults received influenza vaccination at stores (supermarket or drug store), the second most common place of vaccination after a doctor's office.² We determined the incidence of needlestick injuries (NSIs) among pharmacists at one nationwide retail pharmacy chain from 2000 to 2011.

METHODS

As of February 2011, 2,150 certified immunizing pharmacists, specially trained through an immunization certification program, were employed at 805 pharmacy locations in 25 states within the retail pharmacy chain. The company began offering adult vaccinations in 2000 and had expanded this service to all locations. Vaccinations offered included the influenza, pneumococcal, tetanus/diphtheria/pertussis, hepatitis A, hepatitis B, human papillomavirus, herpes zoster, and meningococcal vaccines. Vaccinations are offered by appointment or on a walk-in basis at the pharmacies or in a clinic setting. Pharmacists and some pharmacy technicians also perform fingersticks using lancet needles during health screenings. The company's NSI reporting form contained information about the type and brand of device involved and an explanation of how the incident occurred, per the Occupational Safety and Health Administration (OSHA) bloodborne pathogens standard.

We reviewed the company's centralized NSI reports from all pharmacy locations and characterized the circumstances surrounding these reported injuries. We calculated the annual incidence of NSI using 2 methods: by dividing the total number of NSIs reported during a given year by (1) the total number of vaccinations administered by the company during that same year and (2) the total number of immunizing phar-

macists employed by the company during that same year. Because the focus of our evaluation was on NSIs in immunizing pharmacists, we excluded injuries involving lancet needles in our annual incidence calculations. We also reviewed the company's written policies regarding vaccine administration, NSIs, and bloodborne pathogens.

RESULTS

Thirty-three NSIs were reported to the company's centralized database by 31 different pharmacy locations from 2000 to 2011. No pharmacists were reported to have been infected with bloodborne pathogens after their NSIs. Of 33 injuries, 24 (73%) occurred from September through January, the period during which influenza vaccines are commonly administered.

Five (15%) NSIs occurred with a lancet needle; 28 (85%) injuries occurred with a syringe needle. Of these 28 injuries, the needles used were the BD SafetyGlide needle ($n = 12$), VanishPoint syringe ($n = 7$), BD PrecisionGlide needle ($n = 1$), BD Safety-Lok syringe ($n = 1$), and "unspecified" ($n = 2$). Injury body parts included a finger ($n = 30$), palm ($n = 1$), and "unspecified" ($n = 2$).

The company's NSI report form contained check boxes for an explanation of how the injury occurred but did not specifically ask if the device's protective mechanism had been activated or had malfunctioned. Most commonly, the injury was reported to have occurred after use and before disposal of the sharp ($n = 19$, 58% of injuries). Other explanations included during use of the sharp ($n = 6$), while putting sharp into disposal container ($n = 5$), while disassembling ($n = 2$), sharp left in inappropriate place ($n = 2$), and "other" ($n = 4$).

NSIs ranged from 0 to 14 per year (Table 1). The years 2000–2001 and 2004–2007 had no NSIs reported, while 2010 had the highest number of NSIs at 14. We excluded the 5 NSIs associated with lancet needles from annual incidence calculations. The annual incidence of NSIs ranged from 0 to 3.62 per 100,000 vaccinations and ranged from 0 to 5.65 per 1,000 immunizing pharmacists (Table 1). The year 2010 had the highest incidence at 3.62 NSIs per 100,000 vaccinations and 5.65 per 1,000 immunizing pharmacists.

The company's written policies and procedures regarding vaccine administration, NSIs, and bloodborne pathogens were comprehensive and contained all of the required elements in the OSHA bloodborne pathogens standard.

DISCUSSION

Pharmacists who have the added responsibility of administering vaccinations are an emerging occupational group at

TABLE 1. Annual Numbers of Needlestick Injuries, Administered Vaccinations, and Immunizing Pharmacists

Year	No. of needlestick injuries	No. of administered vaccinations	Annual incidence per 100,000 vaccinations	No. of immunizing pharmacists	Annual incidence per 1,000 immunizing pharmacists
2000	0	9,900	0	67	0
2001	0	38,000	0	120	0
2002	1	55,685	1.80	270	3.70
2003	1	156,000	0.64	400	2.50
2004	0	42,000	0	540	0
2005	0	225,000	0	731	0
2006	0	129,965	0	538	0
2007	0	146,525	0	821	0
2008	2	232,050	0.86	1,043	1.92
2009	6	391,850	1.28 ^a	1,450	3.45 ^a
2010	14	358,800	3.62 ^b	2,300	5.65 ^b
2011 ^c	9	286,383	2.10 ^d	2,164	2.77 ^d

^a One injury was excluded from the 2009 incidence calculation because it was associated with a lancet needle.

^b One injury was excluded from the 2010 incidence calculation because it was associated with a lancet needle.

^c 2011 data as of November 3, 2011.

^d Three injuries were excluded from the 2011 incidence calculation because they were associated with a lancet needle.

risk of NSIs. NSIs and other percutaneous injuries pose the greatest risk of occupational transmission of bloodborne pathogens to healthcare workers.^{3,4} To date, this is the first published study examining NSIs in immunizing pharmacists working in retail pharmacies, and few studies have examined NSIs associated with vaccination.⁵⁻⁷

In a study by Haire and Sharma,⁵ 5 of 54 nurses and physicians reported sustaining a contaminated NSI during a measles and rubella immunization campaign in Britain in 1994. Abraham and Middleton⁶ reported 6 documented contaminated NSIs during a measles mass vaccination campaign in Canada in 1996. In this campaign, 63 nurses immunized 112,727 children at 238 schools, and the NSI rate was calculated to be 5.32 NSIs per 100,000 vaccinations. Circumstances leading to the injuries included technical factors, human factors, and disposal issues. These rates are higher than the maximum of 3.62 NSIs per 100,000 vaccinations found in our evaluation in 2010.

More recently, Williams et al⁷ reported 7.8 NSIs per 100,000 vaccinations in a local health department's 2009 pandemic influenza A(H1N1) mass vaccination clinics. During routine vaccination clinics from 2003 to 2009 in that same health department, rates ranged from 0 to 3.3 NSIs per 100,000 vaccinations, which are similar to those found in our evaluation.

Our range of 0–5.65 NSIs per 1,000 immunizing pharmacists is lower than the range of 23–103 NSIs per 1,000 healthcare workers calculated by Lee et al⁸ in 5 studies of reports in hospital settings. This discrepancy can be explained by factors that may include the nature of the procedures that require less manipulation, activation of the safety devices, company training programs, and safe work practices. Nevertheless, most NSIs reported at this retail pharmacy chain

were likely preventable through adherence to safe work practices.

It is possible that an influx of newer, inexperienced pharmacists in 2010 could explain the increase in NSIs that year, but we were unable to determine the term of employment for the injured employees. Also, 11 (79%) of the 14 NSIs occurred during peak influenza vaccination months, but we were unable to determine whether these injuries occurred in mass vaccination clinic settings.

Our evaluation was subject to some limitations. First, the incidence of NSIs reported here is likely an underestimation of the actual incidence for 2 reasons. Studies have shown that underreporting of percutaneous injuries in healthcare workers occurs widely, with an estimated 43.4% underreporting rate.⁹ Also, it is possible that not all incidents at individual pharmacy locations were reported to the national centralized database. Second, some NSI reports had missing information, including type of device and injured body part. Third, we had limited information on the injured employee so were not able to determine work factors associated with an injury.

In conclusion, immunizing pharmacists are an emerging occupational group at risk of NSIs. The NSIs reported in this retail pharmacy chain were largely preventable. On the basis of our findings, we recommended that the company follow existing guidelines to improve its NSI prevention program¹⁰ and ensure that each NSI report contains all information required by the OSHA bloodborne pathogens standard. We also recommended obtaining additional information on injury circumstances, such as whether the device's protective mechanism had been activated and the needle's original purpose. This will help better determine factors contributing to these injuries at the pharmacy and to evaluate the safety of devices. Employees should continue to use safe work practices

during vaccine administration and should promptly report all NSIs.

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REFERENCES

1. American Pharmacists Association. *States where pharmacists can immunize*. Washington, DC: American Pharmacists Association; 2009. http://www.pharmacist.com/am/template.cfm?section=pharmacist_immunization_center1&template=/cm/contentdisplay.cfm&contentid=21623. Accessed December 19, 2011.
2. Centers for Disease Control and Prevention. Places of influenza vaccination among adults—United States, 2010–2011 influenza season. *MMWR Morb Mortal Wkly Rep* 2011;60:781–785.
3. Beltrami EM, Williams IT, Shapiro CN, Chamberland ME. Risk and management of blood-borne infections in health care workers. *Clin Microbiol Rev* 2000;13:385–407.
4. Centers for Disease Control and Prevention. Updated US Public Health Service guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations for postexposure prophylaxis. *MMWR Morb Mortal Wkly Rep* 2001;50(RR-11):1–52.
5. Haire AR, Sharma A. Fewer needlestick injuries than expected occurred during immunization campaign. *BMJ* 1996;312:1303.
6. Abraham E, Middleton D. Needlestick injuries during a mass vaccination campaign. *Can J Public Health* 1997;88:38–39.
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* doi: 10.1016/j.ajic.2011.09.014. Published February 2, 2012.
8. Lee JM, Botteman MF, Xanthakos JD, Nicklasson L. Needlestick injuries in the United States: epidemiologic, economic, and quality of life issues. *AAOHN J* 2005;53:117–133.
9. Panlilio AL, Orelien JG, Srivastava PU, et al. Estimate of the annual number of percutaneous injuries among hospital-based healthcare workers in the United States, 1997–1998. *Infect Control Hosp Epidemiol* 2004;25:556–562.
10. Centers for Disease Control and Prevention. Workbook for designing, implementing and evaluating a sharps injury prevention program. Atlanta, GA; 2008. http://www.cdc.gov/sharpsafety/pdf/sharpsworkbook_2008.pdf. Accessed April 2012.