

Sharps and Needlestick Injuries Among Medical Students, Surgical Residents, Faculty, and Operating Room Staff at a Single Academic Institution

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BACKGROUND: The hospital is a place of high risk for sharps and needlestick injuries (SNI) and such injuries are historically underreported.

METHODS: This institutional review board approved study compares the incidence of SNI among all surgical personnel at a single academic institution via an anonymous electronic survey distributed to medical students, surgical residents, general surgery attendings, surgical technicians, and operating room nurses.

RESULTS: The overall survey response rate was 37% (195/528). Among all respondents, 55% (107/195) had a history of a SNI in the workplace. The overall report rate following an initial SNI was 64%. Surgical staff reported SNIs more frequently, with an incidence rate ratio (IRR) of 1.33 ($p = 0.085$) when compared with attendings. When compared with surgical attendings, medical students (IRR of 2.86, $p = 0.008$) and residents (IRR of 2.21, $p = 0.04$) were more likely to cite fear as a reason for not reporting SNIs. Approximately 65% of respondents did not report their exposure either because of the time consuming process or the patient involved was perceived to be low-risk or both.

CONCLUSIONS: The 2 most common reasons for not reporting SNIs at our institution are because of the inability to complete the time consuming reporting process and fear of embarrassment or punitive response because of admitting an injury. Further research is necessary to mitigate these factors. (J Surg Ed ■■■■-■■■■. © 2016 Published by Elsevier Inc. on behalf of the Association of Program Directors in Surgery)

KEY WORDS: sharps, needlestick, medical student, resident, surgical technician, operating room nurse, surgery attending

COMPETENCIES: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement, Interpersonal and Communication Skills, Professionalism, Systems-Based Practice

INTRODUCTION

Sharps and needlestick injuries (SNI) are a prevalent and serious matter in the health care industry. It is particularly the transmission of blood-borne pathogens, such as human immunodeficiency virus (HIV), hepatitis B virus, and hepatitis C virus (HCV) that are of most concern. HIV transmission following parenteral exposure to blood from HIV-infected source patients is 0.32% (1/325).¹ HCV transmission following parenteral exposures to blood from HCV-infected source patients is 1.9% estimated infection risk per exposure.² The transmission risk increases with needle size and depth of penetration.³ According to the most recent Centers for Disease Control and Prevention statistics, approximately 384,000 SNI occur each year within hospitals in the United States, with 23% of such injuries occurring within the setting of the operating room (OR).⁴ Recent data have shown that SNIs outside the OR have dropped 31.6% because of practice changes associated with the approval of the Needlestick Safety and Prevention Act; however, SNIs in the OR have increased 6.5%.^{5,6}

Surgeons, trainees, and surgical employees are at higher risk for SNI events as they are predominantly in the OR setting.⁷ This poses a substantial problem as studies have shown an underreporting of these injuries in the surgical

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arena because of a lack of available time.^{1,8-12} There have been previous studies examining SNI in different groups of health care employees, but few studies have included multiple groups together.

The purpose of this study is to compare the incidence of SNI and the rates of reporting among all OR personnel at a single institution: medical students, surgical residents, general surgery faculty, and surgical technicians/nurses.

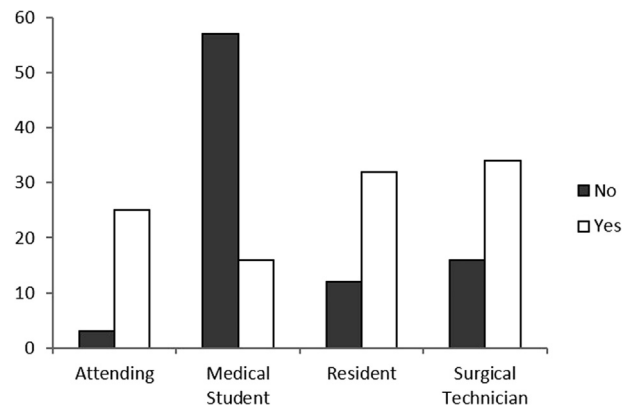
METHODS

Institutional Review Board approval was obtained and an anonymous electronic survey was generated and distributed using SurveyMonkey,¹³ consisting of 10 questions (Appendix A). The survey assessed SNI history, the number of SNI events, the rates of proper reporting of SNIs to employee health, and reasons for not reporting. Response options were created to determine the reasons for not reporting SNIs in each group. Response examples included patient history (low-risk patient), time consuming process, and a free response option. The final question assessed responders' likelihood of reporting SNIs in the future if the needlestick injury protocol was less time consuming. The survey was administered to third and fourth year medical students, surgical residents (general surgery, otolaryngology, plastic surgery, orthopedic surgery, and neurosurgery), general surgery attendings, surgical technicians, and OR nurses at a single academic institution. As part of pre-employment training or clerkship orientation, all groups received education about needlestick injuries and information regarding institutional policies of reporting of such incidents.

The survey was open for 30 days with 2 e-mail reminders. Overall, 27% (74/269) of medical students, 51% (44/87) of residents, 56% (28/50) of attendings, and 41% (50/122) of surgical technicians and OR nurses completed the survey producing an overall response rate of 37% (196/528). The data were exported to Microsoft Excel spreadsheet (Microsoft Corporation, Redmond, WA) and statistically analyzed with STATA 11.1¹⁴ using Poisson regression. The threshold for statistical significance was set at 0.05.

RESULTS

Among all 4 groups, 55% (107/195) of respondents claimed a history of sustaining an SNI in the workplace: 22% of medical students, 72% of residents, 89% of attendings, and 68% of surgical technicians/OR nurses (Fig. 1). Report rates after a first time SNI were 85% (29/34) in surgical techs and OR nurses, 64% (16/25) in attendings, 50% (16/32) in residents, and 44% (7/16) in medical students. Surgical technicians and OR nurses were more likely to report a SNI when compared with



	No	Yes	%
Attending	3	25	89%
Medical Student	57	16	22%
Resident	12	32	72%
Surgical Technician	16	34	68%

FIGURE 1. Question 2: Have you ever had a needlestick injury? Responses by cohort.

attendings, with an incidence rate ratio (IRR) of 1.33 ($p = 0.085$) (Fig. 2).

Of the respondents who had multiple needlestick injuries, 39% (41/105) reported every exposure, specifically 43% of medical students, 20% of residents, 32% of attendings, and 62% of surgical technicians and OR nurses. Those who did not report every exposure were allowed to provide for not reporting their SNIs. 64% said it was because of an excessively time consuming process, 66.7% did not report because of the SNI involving a low-risk patient, and 33.3% free typed a response (Table). Overall, 54.1% of subjects chose to report sharps exposure based on patient history; 44% (7/16) of medical students, 73% (24/32) of residents, 56% (14/25) of attendings, and 36% (12/33) of surgical technicians and OR nurses.

Further, 69% (11/16) of medical students, 53% (17/32) of residents, 24% (6/25) of attendings, and 26% (9/34) of surgical techs and OR nurses cited fearfulness as a reason for not reporting their SNIs (Fig. 3). When compared with attendings, medical students and residents more often cited fear as a reason for not reporting a SNI (IRR of 2.86, $p = 0.008$ and an IRR of 2.21, $p = 0.04$, respectively) (Fig. 2).

At our institution like many others, SNI reporting is performed and processed in the office of Employee Health. Overall, of those who reported their experience with this process, 38.4% were satisfied, 15.2% unsatisfied, and 20.5% ambivalent. Of the respondents who were unsatisfied, 86.8% said the time consuming process at Employee Health was the cause of their dissatisfaction. Among all those surveyed who had an experience with Employee Health, 85.7% responded that they would be

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