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Violence: Recognition, Management and Prevention

WEAPONS RETRIEVED AFTER THE IMPLEMENTATION OF EMERGENCY DEPARTMENT METAL DETECTION

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☐ **Abstract—Background: Several high-profile violent incidents have occurred within emergency departments (EDs). There are no recent studies reporting the effectiveness of ED metal detection. Objective: Our aim was to assess the effect of metal detection on ED weapons retrieval. Methods: In September 2011, a metal detector was installed at the entrance of an urban, high-volume teaching hospital ED. The security company recorded retrieved firearms, knives, chemical sprays, and other weapons. We performed qualitative analysis of weapons retrieval data for a 26-month period. Results: A total of 5877 weapons were retrieved, an average of 218 per month: 268 firearms, 4842 knives, 512 chemical sprays, and 275 other weapons, such as brass knuckles, stun guns, and box cutters. The number of retrieved guns decreased from 2012 to 2013 (from 182 to 47), despite an increase in metal detection hours from 8 h per day to 16 h per day. The number of retrieved knives, chemical sprays, and other weapons increased. Recovered knives increased from 2062 in 2012 to 2222 in 2013, chemical sprays increased from 170 to 305, and other weapons increased from 51 to 201. Conclusions: A large number of weapons were retrieved after the initiation of metal detection in the ED entrance. Increasing hours of metal detection increased the number of retrieved knives, chemical sprays, and other weapons. Retrieved firearms decreased after increasing metal detection hours. Metal detection in the ED entrance is effective in reducing entrance of weapons into the ED. Metal detectors may offer additional benefit in reducing attempts to enter with firearms.** © **2015 Elsevier Inc.**

☐ **Keywords—operations; violence; weapons; patient safety; employee safety; administration**

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INTRODUCTION

There have been several high-profile acts of violence involving deadly weapons in United States (US) emergency departments (EDs) within the past decade (1–5). A 2012 Crime and Security Trends Survey reported a 37% increase in violent crime within health care organizations from 2010 to 2012 (5). The International Association for Healthcare Security reported in 2010 that the greatest number of physical assaults against health care providers occurred in EDs (1). A 2011 survey of ED physicians confirmed the high prevalence of assault, reporting that 78% had experienced at least one act of violence within the workplace (6).

Metal detectors are commonplace in public venues, such as stadiums, airports, museums, government facilities, and even schools. Some hospitals have been reluctant to implement use of metal detectors. In an era of budget restrictions, the cost benefit of metal detection is

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not clear and may represent a significant expense. In addition, hospital administrators may fear that implementing metal detection represents negative profiling of patients and may be off-putting to visitors (7). In fact, in 2013, Los Angeles County opted to remove metal detectors from several of their hospitals in order to make the hospitals more "appealing to patients" (8).

Data, however, suggest that the public is amenable to the presence of metal detectors. Several studies have explored attitudes toward metal detectors and found that patients, families, and hospital staff have generally positive perceptions of the use of metal detection in the ED, citing increased feelings of safety and security as positive effects (7–10). Despite this, less than half of surveyed physicians in 2011 reported working at an ED with metal detectors (6).

It is also difficult to prove the efficacy of metal detection in retrieving dangerous weapons and preventing violent assault. To date, there are only two published studies exploring the efficacy of metal detectors for retrieving weapons in the ED, and none within the past decade (10,11). Our goal is to assess the effect of metal detection on preventing weapon entry into an urban ED.

METHODS

We performed a retrospective review of security records for a 26-month period from September 2011 to December 2013. In September 2011, a metal detector and "no weapons" signage were installed in the entrance of an urban private community teaching hospital ED (110,000 visits/year) located in the Midwest. This ED is a Level 1 trauma center serving adult and pediatric patients. All ambulatory patients are screened on entrance to the ED registration area via an arch-style walk-through metal detector staffed by security personnel. Patients arriving by ambulance or helicopter are excluded from metal detection. Hospital employees wearing hospital attire or displaying a hospital badge are also excluded from screening.

The security company recorded all retrieved metallic weapons including firearms, knives, chemical sprays, and other potentially dangerous metal objects (such as box cutters and crowbars). Metal detection was initially available 8 h per day in 2011 and 2012 and increased to 16 h per day in 2013. We analyzed weapons retrieval data and trends for a 26-month period and compared weapon retrieval between 2012 and 2013.

RESULTS

A total of 5877 weapons were retrieved during this 26-month period, for an average of 218 per month. This includes 268 firearms (4.6%), 4842 knives (82%), 512 chemical sprays (8.7%), and 275 other potential weapons, such as brass knuckles, stun guns, and box cutters (4.7%) (Table 1). The number of retrieved guns decreased from 2012 to 2013 (from 182 to 47; $p < 0.001$). Conversely, the number of retrieved knives, chemical sprays, and other potential weapons increased. Retrieved knives increased from 2062 to 2222 ($p = 0.002$), chemical sprays increased from 170 to 305 ($p < 0.001$), and other potential weapons increased from 51 to 201 ($p < 0.001$) (Figures 1 and 2).

DISCUSSION

A significant number of weapons were retrieved after the installation of metal detectors and security personnel in the ED entrance. This suggests that a significant number of concealed weapons were present in the ED before the installation of metal detectors. This number underestimates the total number of potential weapons entering the ED as ambulance patients were not screened and metal detection was not available 24 h per day during the observed time period. Additionally, security reported anecdotally that it was not unusual to see people begin to enter the building and then turn around after seeing the metal detection system. Some of these people may have harbored weapons that otherwise would have accompanied them into the ED. Hospital maintenance personnel also reported finding discarded weapons in the landscaping outside of the ED after the initiation of metal detection.

Table 1. Weapons Retrieved per Study Period

	2011–2012			2013			Significant Δ
	Min	Max	Mean (SD)	Min	Max	Mean (SD)	*p* Value
Firearms	7	22	13.8 (4.4)	0	8	4.3 (2.8)	< 0.001
Knives	113	208	163.8 (27.1)	146	244	202.0 (30.6)	0.002
Chemical spray	3	24	12.9 (5.2)	12	45	27.7 (8.2)	< 0.001
Other	0	16	4.6 (4.0)	7	32	18.2 (8.2)	< 0.001

SD = standard deviation.