

EFFECTIVENESS OF CONDUCTED ELECTRICAL WEAPONS TO PREVENT VIOLENCE-RELATED INJURIES IN THE HOSPITAL

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Contribution to Emergency Nursing Practice

- Violence-related injuries in health care—particularly in the emergency department—are of great concern. There is, therefore, a pressing need for evidence-based approaches to decrease rates of injury. High-risk workers lack information on the effectiveness of possible interventions that could reduce the risk of violence-related injuries. More hospitals are arming their security workers with tools of law enforcement to prevent violent injuries. This is the first study to examine whether the use of one of those tools—conducted electrical weapons—reduces the risk of injury.
- Emergency nurses need to be aware of the potential for security officers' tools to prevent serious injury.
- Although the study findings do not demonstrate a decrease in the overall rates of violence-related injuries to hospital staff after security officers began carrying conducted electrical weapons, the severity of violence-related injuries may have been reduced.

Abstract

Introduction: Health care workers suffer higher rates of violence-related injuries than workers in other industries, with hospital security officers and ED personnel at particularly high risk for injury. Arming hospital security workers with conducted electrical weapons, such as tasers, has been suggested as an intervention to decrease violence-related injuries in the hospital.

Methods: A retrospective cohort of all security and ED nursing staff at an urban level 1 trauma center was identified from human resources data for the period 4 years before and 7 years after security workers were armed with conducted electrical weapons. A violence-related rate of injury was calculated as all violence-related injuries incurred by each employee for the numerator and the productive hours worked by each person during the study period as the denominator.

Results: The hospital employed approximately 30 security staff and 200 nursing staff at the time, with a total of 98 security officers and 468 nursing staff members over the 11 years of study. During the total nursing study period, 98 security officers contributed 452,901 hours; 265 registered nurses from the emergency department contributed 1,535,044 hours; and 203 health care assistants contributed 624,805 hours. Security officers' violence-related rate of injury was 13 times higher than that of the nursing staff. The risk ratio was 1.0 (95% confidence interval [CI] 0.7–1.4) between the 2 examination periods for security officers, with similar results for nurses. However, among security workers, the cost of the injuries decreased in the period after implementation.

Conclusion: Carrying conducted electrical weapons by hospital security staff appears to have limited capacity to decrease overall rates of violence-related injury but may decrease the severity of violence-related injuries. The latter could decrease costs to health care organizations as well as morbidity of injured staff.

Key words: Workplace violence; Hospital safety; Conducted electrical weapons (CEWs); Occupational; Health care injuries; Injury prevention

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Workers in health care had the highest incidence rate of workplace violence-related injuries involving days away from work compared with all other private industries in 2013.¹ The rate of violence-related injuries resulting in lost workdays per 10,000 workers in the health care and social assistance industry was 16.2, compared with 4.2 for the entire private industry. Within the health care sector, occupations vary greatly in their risk of workplace violence. Mental health workers and other ancillary staff in psychiatric health care are frequently documented as having higher rates of assault than other health care workers,^{2,3} and the emergency department has long been recognized as a location in the hospital where nurses and medical doctors are at a higher risk for violent injury than in other areas of the hospital.^{2,4,5}

Hospital safety and security workers are often overlooked in the health care violence-related injury literature. The relatively few studies that do include hospital security workers demonstrate that these workers have some of the highest rates of violence-related injuries within the hospital setting, with anywhere from 2 to 5 times as many injuries as nurses.^{2,3,6,7} However, although there are many investigations of risk factors and interventions to decrease risk for violent injuries among health care staff,^{4,8–17} almost no studies were conducted that specifically detail the risk and protective factors for violent injury to hospital security personnel.

One intervention that has been implemented and identified as potentially highly useful to decrease violence-related injuries is the arming of hospital security staff with conducted electrical weapons (CEWs), such as tasers.¹⁸ Ho et al found that, among hospital security workers, staff injuries decreased from 31 in the year before implementation to 20 in the year after implementation. In addition, the severity of injuries apparently decreased; there were 18 days of lost employee time and 350 days of restricted work in the 12 preceding months, whereas there were 0 days of lost employee time and 16 days of restricted work in the first 12 months after introduction of CEWs.

Some studies of the use of CEWs in criminal justice have found fewer injuries among both police officers and suspects following the implementation of CEWs,^{19–21} although the risk for less severe injuries to suspects may increase with the use of CEWs.²² In addition, field studies of the use of CEWs in law enforcement have not found risk of cardiac death or severe injury with deployment of CEWs against suspects.^{23,24} However, a few deaths of suspects have occurred shortly after the use of CEWs, prompting some to suggest a causal association with CEWs,^{25,26} although a common pathophysiologic cause is questionable.²⁷ As the relative safety of CEWs has been questioned, there is no doubt that the increased use of CEWs in the health care setting should be accompanied with research into the safety and effectiveness of such strategies.²⁸

The goals of this study were to determine if the introduction of CEW carriage by hospital security officers affected the rates of injury among the security staff in the 7 years after their introduction and the rates of injury among the ED nursing staff in the 7 years after their introduction. A third goal of this study was to explore other factors related to injuries to security staff, including the severity of injury and demographic factors associated with violence-related injuries to security staff, as there have been no previous examinations of the risk factors for violence-related injuries among this population.

Methods

This investigation is a retrospective cohort study of two hospital employee populations: the hospital security staff and ED nursing staff in one urban hospital from January 1, 2004, to December 31, 2014. The hospital is a level 1 trauma center, located in the metropolitan core of a midwestern city. The hospital has 472 beds, 102 of which are designated for psychiatric patients. On average, 335 of all beds were occupied daily by patients in 2014. The emergency department, including urgent care, had 109,809

TABLE 1

Demographics of study personnel

Occupational Group	Total	Female n (%)	Male n (%)	Median Age (Quartiles 1 and 4)	Median Experience in Years (Quartiles 1 and 4)
Security Personnel	98	13 (13)	85 (87)	38 (21–31, 44–61)	7 (0–2, 14–33)
Registered Nurses	265	210 (79)	55 (21)	44 (23–36, 51–69)	7 (0–3, 13–34)
Health Care Assistants	203	121 (60)	82 (40)	30 (18–26, 40–64)	2 (0–1, 7–21)
Nursing Staff	468	331 (71)	137 (29)	40 (18–31, 49–69)	5 (0–2, 11–34)

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