A team approach to needlestick injuries

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Abstract

This article summarizes Mohawk Valley Psychiatric Center's project that eliminated needlestick injuries for two consecutive years. A retrospective study revealed that unsafe equipment and devices caused most of the needlestick injuries. A multifaceted team approach, using new, improved designs in needle devices and equipment, proved to be successful in eliminating needlestick injuries at the center.

Introduction

Needlestick injury is a high-risk occupational hazard that is prevalent in most health care facilities.[1-6] The literature has a plethora of information to assist facilities in reducing the risk of needlestick injuries.[7-15] The Centers for Disease Control and Prevention (CDC) states that 1,450 workers became infected with hepatitis in 1993 because of occupational exposure to blood and serum-derived products.[3] Each year, at least 1,000 health care workers contract serious infections from needlestick injuries.[10] This article will describe how our center managed to become free of needlestick injuries for two consecutive years.

Discussion

Mohawk Valley Psychiatric Center (MVPC), a 200-bed center, has demonstrated that needlestick injuries can be eliminated by using the traditional quality improvement (QI) process of: *plan* (specific steps); *do* (execution of the plan); *act* (team implementation and lessons learned); and *check* (Is it working?).

In 1996, the infection-control nurse conducted a three-year retrospective study to determine how many needlestick injuries had been reported and what the circumstances surrounding them were. There were a total of 16 injuries reported for three years, eight in 1994, three in 1995, and five in 1996 (see Figure 1). Although the numbers appear small, these were still preventable high-risk injuries. Each of the affected workers had the potential of becoming infected with hepatitis B, hepatitis C, HIV, or any of a host of other bloodborne diseases.

The number of injuries (16/3 years) was minimal in relation to the number of syringes dispensed (35,000/3 years). However, the facility considered needlestick injuries to be high-risk and preventable, and thus decided that even one needlestick injury was worth the effort of continuing the project.

The data analysis surrounding these injuries revealed that the injuries were caused by:

- Blood-drawing equipment (activating a two-handed safety device);
- Blood withdrawal procedure (breach of policy and procedures, disposal of contaminated equipment);
- Intramuscular or subcutaneous injections (two-handed procedure, unsafe equipment);
- Improper disposal of contaminated equipment (unsafe equipment, overfilled containers);
- Contaminated sharps containers (exposed needles, unsafe equipment).

There were four types of equipment analysis and change that took place. During this change, the products were examined for safety, ease of use (one-handed), and cost.

First, the blood-drawing equipment analysis determined that Pro-Guard equipment had been used in five of the needlestick injuries sustained by blood-drawing equipment. With this type of equipment, if the door slides, it allows the thumb or finger to slip into the holder and onto the rubber-covered needle. This equipment was initially replaced with the Bio-Plexus Punctur-Guard Drop It system. This system blunted the needle once the mechanism was activated. While the Punctur-Guard equipment was "safer," there still was a possibility of a blunt injury. In early 1999, the Retractable Technologies, Inc., Vanish Point blood-drawing equipment became available and was purchased. This new retractable system uses a spring-action retraction of the needle into the holder and is activated by one hand. Once activated, this device makes it virtually impossible to sustain an injury from the contaminated needle.

Second, an analysis of the contaminated sharps containers revealed that four of the injuries occurred when a contaminated needle was being placed in a container that was too full and other contaminated needles were exposed. The cover of the Sage container allowed exposure to other contaminated needles when placing syringes into the container. These containers were replaced with the Bemis Letter Drop, translucent-type container. In being able to see through the container, the nurses could visualize when the container was almost full and then replace it. Also, with the Letter Drop type of

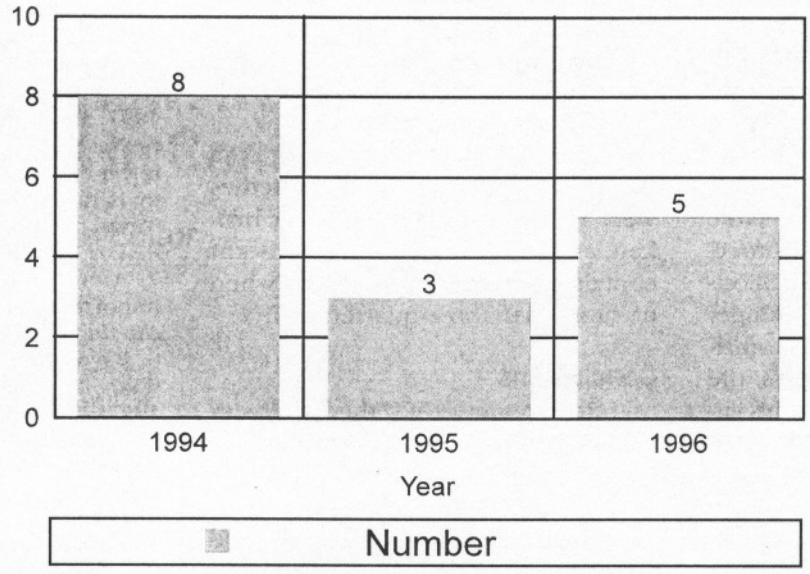

Figure 1. Employee needlestick injuries, 1994-1996.

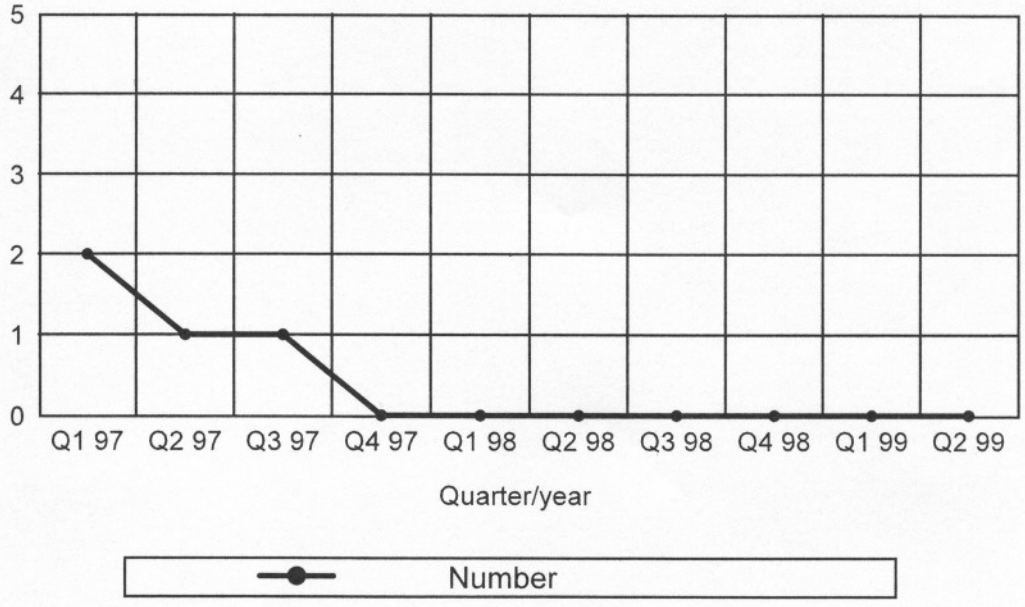

Figure 2. Employee needlestick injuries, January 1997-June 1999.

cover, other contaminated syringes were not exposed.

Third, the analysis of injectable syringes determined that the Monoject Safety's resheathable 3-cc intramuscular syringes were used during four of the needlestick injuries. In late 1997, samples were received of the Vanish Point syringe made by Retractable Technologies, Inc. This retractable syringe requires a one-handed procedure to retract the needle. After injecting the medication, when the plunger continues to be depressed, it automatically retracts the needle from the patient into the syringe barrel. This virtually eliminates any opportunity for risk or contact.

Initially, the retractable syringe appeared to be more expensive. However, a cost analysis revealed that the Vanish Point product yielded an additional benefit of an incremental savings of 45 cents per injection.

On occasion, nurses administer *"stat"* injections to aggressive patients. Special care and assistance is required for this high-risk intervention. During these procedures, the spring-action retractable needle is very useful in reducing injury. The nurses have found these syringes to be superior in every way.

The fourth step in the project was to look for safer intravenous (IV) devices. The result was the selection of the ProtectIV IV Catheter System devices.

Results

Two important aspects of the change in the equipment were that the users (nurses, physicians) had the major input and impact in selecting the final product. The nurses also recognized that new equipment, in and of itself, might increase the risk of injury until staff members were familiar with the product; thus, they needed to use extra caution.

Finally, the policy and procedures surrounding blood drawing and injections were revised and closely monitored. The revisions included a policy that contaminated sharps containers were to be replaced when three-quarters full.

Nursing leadership developed a schedule to monitor whether needles were being recapped, bent, or broken, and that the puncture-resistant containers were being replaced when no more than three-quarters full.

Conclusions

After completing the interventions, the two-year follow-up shows no reported needlestick injuries (see Figure 2). It is true, as Vason states, "No single safety equipment or device will meet all sharp safety needs for all healthcare settings."[16] The success of this project was the result of a multifaceted team approach and vigilance surrounding safety equipment and its use. Exploring, purchasing, and using new and improved designs in needle devices and equipment has reduced the risk of injury to staff and patients. Of course, it is not over yet. Surveillance, training, and evaluation of new devices must be ongoing. However, this project helped all involved to conclude that needlestick injuries can be prevented.

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