Infection Control
# Resource

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*Prevention Strategies for IC Practitioners and Professional Nurses*

## In This issue

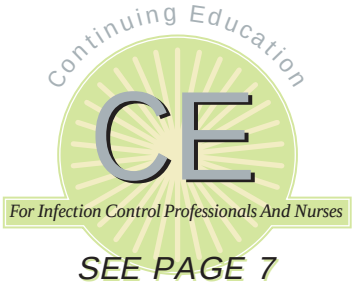
While many institutions have established needlestick prevention programs prior to being mandated by law last year, California Pacific Medical Center (CPMC) was one of the first in the nation to create a formal task force. Over a decade ago, CPMC established the Needlestick Prevention Task Force, and in this issue Ms. DeBaun, a key member of that task force, candidly describes what succeeded and what did not in their mission to protect health care workers and patients.

Every day thousands of needles and lancets are used and disposed of by people with diabetes. Improper disposal of sharps, known as regulated medical waste, puts not only other household members but also the general public, including sanitation workers, in danger of exposure to hazardous diseases from needlestick injuries. Unsafe needlestick practices are widespread — for this reason, it is important that all nurses working with diabetic patients become knowledgeable regarding local medical waste disposal. Educating the person with diabetes at the time of initial diagnosis and periodically assessing the person's sharps-disposal practices for ongoing educational needs are imperative to reduce needlestick injuries resulting from improper disposal practices.



# A Decade of Needlestick Prevention:

## *A California Hospital's Experience*

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Just over a decade ago, California Pacific Medical Center was created as a result of the merger of two large private hospitals in San Francisco. "Cost-savings" measures that occurred shortly after the merger included dissolution of the IV team and decentralization of phlebotomy. Newspaper headlines featured stories about the startlingly high prevalence of HIV in the San Francisco Community and the risks associated with needles and other sharp devices. Times were turbulent, and the efforts to balance cost-containment with a safe environment were and continue to be a tremendous challenge.

This article describes the needlestick injury (NSI) prevention activities that our institution has undertaken during the past decade. At times, we were successful, and at others, we were not. It is important to realize that any NSI prevention program will meet hurdles, and one can expect some trips and falls along the way. It is a journey without a finish line— one, however, that carries rewards for those of us charged with implementing procedures designed to protect our employees from exposure to potentially life-threatening diseases.

### In the beginning . . .

The California Pacific Medical Center Needlestick Prevention Task Force, established in 1989, reviewed NSI reports and determined that most injuries resulted from accessing heparin locks or central lines. Injuries such as these are high-risk, as the needles are hollow-bore and are typically blood-filled. At that time, there were several types of "needleless" systems on the market. A needleless system is currently defined by OSHA as "a device that does not use needles for collection of bodily fluids or withdrawal of body fluids after initial venous or arterial access is established, for administering medication or fluids, or for performing any other procedure that has the potential to cause occupational exposure to bloodborne pathogens through percutaneous injuries from contaminated sharps."

In 1991, our task force selected a needleless system based on ease of use, adaptability, and reliability. We anticipated a challenge obtaining approval from administration in light of the cost-saving measures that were taking place around us. Also, at the time there were no published reports on the efficacy of these systems so we were relying on faith that elimination of needles would translate to reduction of NSIs. Fortunately, implementation of the needleless system was approved. Analysis of internal data demonstrated a 93% reduction in vascular access/IV-related NSIs from 1990 to 1993.[1] Our emergency-department staff has been trained to immediately convert conventional IV tubing (commonly utilized by emergency transport companies) to a needleless system to assure compliance with hospital policy. The reduction of manipulation-associated NSIs from

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# Needlestick prevention:

## *Safe practices for healthcare providers and individuals with diabetes mellitus.*

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Today, more people than ever are able to take control of their diabetes after learning self-management skills. Included in these diabetes skills are checking blood-sugar levels regularly and, for some, giving themselves insulin injections. Literally thousands of needles and lancets are used and disposed of every day by people with diabetes, yet the safe disposal of used diabetic sharps can sometimes be controversial when a person seeks advice from diabetes educators, infection control nurses, professional organizations, and local health authorities. Improper disposal of sharps, known as regulated medical waste, puts not only other household members but also the general public, including sanitation workers, in danger of exposure to hazardous diseases from needlestick injuries.

Old practices—for example, breaking off the insulin needles in the syringe cap, whereby pieces of broken needle can land on the floor to be stepped on, embed under the skin, and cause a host of diseases or other infections—should no longer occur. Tossing syringes into the general trash or recycling bins, or even flushing them down the toilet (whereby innocent sanitary workers are stuck) should also not occur. Do these behaviors still take place? Unfortunately, the answer is yes. For this reason, it is important that all nurses working with diabetic patients become knowledgeable regarding local medical waste disposal. Educating the person with diabetes at the time of initial diagnosis and periodically assessing the person's sharps-disposal practices for ongoing educational needs are imperative to reduce needlestick injuries resulting from improper disposal practices.

### Infection control and caring for individuals with diabetes

Startling statistics about healthcare providers and needlestick injuries are readily available. There are at least 23 known bloodborne pathogens, including hepatitis B and C, and HIV, that spread through contaminated needlesticks.[1,2] Sixty-six percent of needlestick injuries occur after the injection and before the sharps disposal.[2] Even with as many as one million reported needlestick injuries, many go unreported.[1,2,3,4] Needlestick injuries having the greatest risk of pathogen contact are those occurring from a hollow-bore needle, visibly contaminated with blood from an infected person.[4] It can be argued that needlesticks from insulin syringes and glucose-monitoring lancets are of low risk—since the needle is fine-bore and injected only into subcutaneous tissue, and the lancets have no visible blood contamination—but a consistent practice of sharps handling is warranted.[5]

The revised Needlestick Safety and Prevention Act that went into effect April 18, 2001 enforces such practice.[6] This act not only requires the use of sharps devices with engineered safety features, but it also includes provisions for active involvement of front-line healthcare workers to develop an exposure-control plan and to participate in the decision-making process of safety devices and other engineered control needs.[3,4]

According to the most recent statistics from the American Diabetes Association, there are an estimated 16 million people in the United States with diabetes. Of these, up to one million have type-1 diabetes mellitus, which requires the use of syringes or an insulin pump. The remaining have type-2 diabetes mellitus, and some of them also need insulin to better manage their diabetes. With more stringent diagnosing guidelines, an estimated 798,000 people will be diagnosed with diabetes during this year.[7] There are approximately 10 million people with diabetes who use at least one to four needles per day, due to monitoring blood sugar levels and/or needing insulin for treatment.[8] The epidemic of diabetes mellitus brings increasing concern for proper handling of the associated medical waste.

Several regulating agencies and organizations give direction for controlling sharps injuries. The decisions from these groups directly affect professional nurses caring for and educating patients with diabetes. Examples of such organizations are Environmental Protection Agency (EPA), Food and Drug Administration (FDA), and Occupational and Safety Hazard Association (OSHA).[9] In addition, professional societies such as the American Diabetes Association (ADA), American Medical Association (AMA), and American Nurses Association (ANA) set standards for clinical practice.[3,10,11]

Whether the person with diabetes receives care in a hospital, a long-term care setting, a clinic, or independently in the community, attention to safety equipment used and disposal devices must follow minimal standard requirements to prevent bloodborne pathogen exposure. Insulin syringes and glucose monitoring lancets are no exception to regulated sharps practices.

### Insulin administration devices

Because of insulin syringes' seemingly lower risk of bloodborne pathogens, little attention has been given to insulin syringes with safety mechanisms. In the healthcare setting, nurses typically use insulin syringes when administering insulin to diabetic patients. The insulin syringe is not exempt from having engineered safety features available. A needle guard on the insulin syringe, such as the Monoject® Insulin Safety Syringe, gives the nurse added safety while transporting the syringe to the nearest sharps container. Similar to syringes intended for intramuscular use, the insulin safety syringe includes a safety shield that slides and locks over the needle to prevent accidental injury following the injection. Syringes with a built-in safety feature to decrease the risk of exposure while transporting and discarding are helpful to eliminate recapping the needle.[12,13]

Diabetes educators are the best resource for assessing individual equipment needs for home use. There are pen-like devices and insulin-containing cartridges, such as the Humulin Pen, that deliver insulin subcutaneously when traditional syringes are problematic. In many patients, especially those with neurological impairments, these de-

vices have been shown to improve accuracy of insulin administration and/or adherence to the treatment plan.[10,14]

Alternatives to using a syringe for administering insulin are also available, but they are more commonly used in the home with the recommendation of a diabetes educator. A jet injector, such as Advanta Jet, injects insulin as a fine stream into the skin without the use of a needle.[14] Advantages to a jet injector include a potentially more rapid absorption of short-acting insulin and a means to gain medication compliance from patients who are unable to use syringes or those who have needle phobias. However, these devices tend to be more costly and may traumatize the skin, causing bruising due to the pressure from the insulin stream. Because of these issues, jet injectors should not be a routine option for patients with diabetes who need insulin.[10]

## Needle reuse

Diabetes nurse-educators, infection-control nurses, and especially home-health nurses cannot be naive about the practice of needle reuse. While it can be assumed that the practice of reusing needles is more common among the lower socioeconomic classes, cases can be found across the entire diabetic population. Insulin syringes and pen needles are intended for single use because of the inability to guarantee needle sterility, yet some patients find it practical or even necessary to reuse needles. If needle reuse is planned, patients should consult their healthcare provider before initiating the practice. The patient should be instructed in a single-handed recapping technique as well as how to inspect the injection sites for unusual redness or swelling. Since benefits from refrigerating the used syringe or cleansing the needle with alcohol are not known, current recommendations are to store used syringes at room temperature.[10]

## Lancet devices for glucose monitoring

Lancets for glucose monitoring have refined safety features, including retractable lancets and penlets that release the lancet without one needing to touch the lancet. Lancets are considered a high-risk source of pathogen transmission due to the direct contact with blood once the device is used. Lancets used for bedside glucose monitoring should be single-patient use. If a spring-loaded fingerstick device is used on more than one person, it should have a disposable finger guard to prevent the risk of disease transmission, since spring-loaded fingerstick devices have been implicated in the transmission of hepatitis B virus among patients with diabetes mellitus.[15]

## Sharps disposal devices

Since sharps containers are used with all sharps in healthcare settings, OSHA's bloodborne-pathogen standard requirements must be met. Minimum requirements include containers that are sealable, puncture-resistant, leakproof on the sides and bottom, and labeled with a biohazard symbol.[4] There is a variety of designs ranging from simple plastic containers with a protective top enabling a one-handed drop to chemical and thermal disinfecting devices whereby needles are incinerated and sealed at the tip of the syringe. These devices attempt to meet the diverse needs of all healthcare settings, each with a slightly different engineered safety feature.

In addition to the container's puncture resistance and ability to prevent overfilling, serious consideration of the location of the sharps container is needed. The needle disposal unit should be within immediate reach, either mounted on the wall in a strategic location where injections are routinely given, or in a smaller, portable version that can be carried around.[13]

In the community, sharps disposal is a concern due to accidental needlesticks to those who handle the waste.[16] Both the EPA and ADA provide guidelines for disposing of sharps and syringes.[10,16] These guidelines are useful for nurses, whether they are diabetes educators, clinic nurses, or home-care nurses, who are teaching people about home disposal of infectious waste and sharps (table 1). Unfortunately, despite readily available information, people still continue to dispose of sharps in an unsafe and inappropriate manner.

**Dos and Don'ts for the Person with Diabetes**

**DO**

- talk with a diabetes educator, infection control nurse, or pharmacist about sharps disposal
- talk with local government agencies regarding garbage pick-up regulations for home medical waste
- place needles and lancets in a thick, puncture-proof container such as a commercially available sharps container, plastic laundry detergent bottle, or empty bleach bottle
- label the container "Biohazard" or "Do not Recycle" to remind others to be careful with its contents
- secure or tape the lid down with heavy duct or packing tape when the container is full to prevent needle punctures
- place the container in the garbage bin for regular garbage collection

**DON'T**

- place loose sharps directly into the trash
- break, bend, clip, or recap needles
- flush sharps down the toilet
- let children handle sharps containers
- place sharps in plastic milk jugs, glass containers, or pop cans
- place sharps containers in recycling bins

Table 1. Sharps Disposal Guidelines

Home-care nurses play an active role in medical waste disposal and must be aware of improper practices in the home. Whether the nurse is specifically educating the client and/or family on self-monitoring and insulin injections, or tending to other health problems with the diabetic patient, an assessment of home medical-waste practices should occur.[2]

Several studies support ongoing assessment of medical waste practices. One study of syringe disposal practices among insulin users reported that only about half of the people actually disposed of syringes properly, while most said they had been told about proper disposal methods.[17] Another study found people routinely flushing syringes down the toilet, causing an environmental and public health hazard.[16] In a recent study by McConville and Hamilton, diabetic patients continued to routinely discard syringes in the trash; however, the practice of flushing the syringes down the toilet had diminished.[18] Consistently noted in all studies is the fact that most people with diabetes received information about proper disposal of sharps. When one looks at actual practice patterns, it is clear that assessment and education regarding sharps disposal is needed periodically.

In addition to federal regulations, some cities and states have specific laws about how to dispose of used sharps. Nurse-educators and clinicians are vital to providing proper information on syringe disposal while addressing specific regulations in different states and communities. If local government does not regulate sharps, general recommendations include:[8,10,16,19]

- Put used sharps into a strong metal container or plastic container with a tight lid. The container should be nonbreakable and heavy enough so the sharps cannot poke through—for instance, an empty plastic bleach or detergent bottle.

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*A Decade of Needlestick Prevention — Continued from page 1*

1991–1993 (figure 1) was largely attributed to the needleless system.

One year following implementation of a needleless system at California Pacific Medical Center, the FDA published a safety alert bulletin to provide direction on FDA enforcement of the OSHA regulations and risk management within the healthcare organization for NSIs. This alert strongly *recommended* the use of needleless or shielded needles to make IV connections. According to the November 5, 1999 revised Federal OSHA Compliance Directive, these systems are now *required*.[2]

In 1990, California Pacific Medical Center (formerly Pacific Presbyterian Medical Center) was one of three U.S. medical centers to participate in a three-phase evaluation of a single-use 3-cc shielded syringe (Monoject® Safety Syringe). During our baseline period, there were eleven NSIs due to conventional 3-cc syringes. During the training phase, we inserviced staff on the 3-cc shielded syringe using printed materials, videotape, demonstrations, and hands-on practice. The number of NSIs due to the shielded device in the two-month trial period was zero. Our findings supported the task force's recommendation to implement the product housewide.[3]

## Not losing sight of the basics

It has become abundantly clear that sharps with engineered injury-protection are only part of the solution. When reports on our NSI data are given at committee meetings, there is always a need to explain why NSIs continue to occur, despite use of numerous devices designed to prevent such injuries. Why, for example, do we continue to hear about NSIs that occur in spite of blunting phlebotomy needles, re-sheathing syringes, and devices that permit a needle-free transfer of blood from a syringe to a tube? Simply stated, the majority of injuries reported at our medical center occur due to the user's failure to activate the safety feature. In addition, some injuries occur during manipulation or before activation of the safety feature is appropriate. For these reasons, we have incorporated a detailed review of the basic procedures in our nursing orientation and annual review. Prior to a detailed discussion of NSI prevention, nurses are asked to list human or environmental factors that contribute to the likelihood of a NSI. Of note is the fact that "proper lighting" is the factor most commonly forgotten. It is probably not surprising that often nurses are so concerned about patient comfort that many may prefer to compromise personal safety rather than risk disturbing the patient by turning on the lights. This is usually the time we point out that the average age of a nurse in our institution is 48 years; most of us get a chuckle when we acknowledge that the majority of us are also a bit visually compromised without our bifocals! Other human and environmental factors that contribute to the problem are listed in table 1.

## Considering the whole picture

We have learned that rarely, if ever, will one device work in all clinical applications. After an extensive evaluation, we recently converted our entire medical center to a needle-based safety needle. Our front-line healthcare workers who conducted the trial deemed newer technology more acceptable. Despite our best efforts to conduct a thorough evaluation, we learned that we failed to consider the issue of dead space. Our pediatric clinic was the first to identify the problem, and it was soon verified when we realized that a vial of influenza vaccine was delivering eight doses of vaccine, rather than the ten actually contained in the vial. This became an even more pressing issue in light of the fact that influenza vaccine was in short supply last year.

Another example of our failure to complete the evaluation process occurred when a change in our clinical laboratory's blood-culture collection system required implementation of a larger blood-transfer device.* We failed to recognize that these larger transfer domes did not fit into the opening of the majority of our mailbox-type sharps containers. The end result was that NSIs occurred when staff attempted to force the used transfer device into the existing sharps containers. This example demonstrates the importance of recognizing the impact one change can have on the entire system. We conducted a search for a sharps container that would better meet our needs and chose an 18-gallon container with a foot-operated lid and an opening large enough to accommodate the transfer devices along with potentially problematic devices such as guide-wires and emergency drug delivery systems. The containers are secured in wire carts with wheels, which enables healthcare workers to transport them to the point of use when disposal of large volumes of sharps (e.g., code blues) or large devices (e.g., central line placement) is anticipated (figure 2).

| Human Factors | Environmental Factors |
|---|---|
| Patient combative/ restless/uncooperative | Sharps container: location, size of opening, degree of fullness |
| Position of patient; height of bed | Clutter |
| Visitors; other staff in room | Lighting |
| Experience of nurse (novice v. highly skilled); familiarity with sharps safety feature | Noise |

**Table 1**. Human and environmental factors contributing to needlestick injuries

## Training challenges

Education of staff is one of the most challenging and potentially frustrating components of a sharps-injury prevention program. We all recognize that the nationwide nursing shortage has affected who and how we teach. A nursing staff of mostly full-time nurses is a thing of the past in many parts of the U.S. California Pacific Medical Cen-

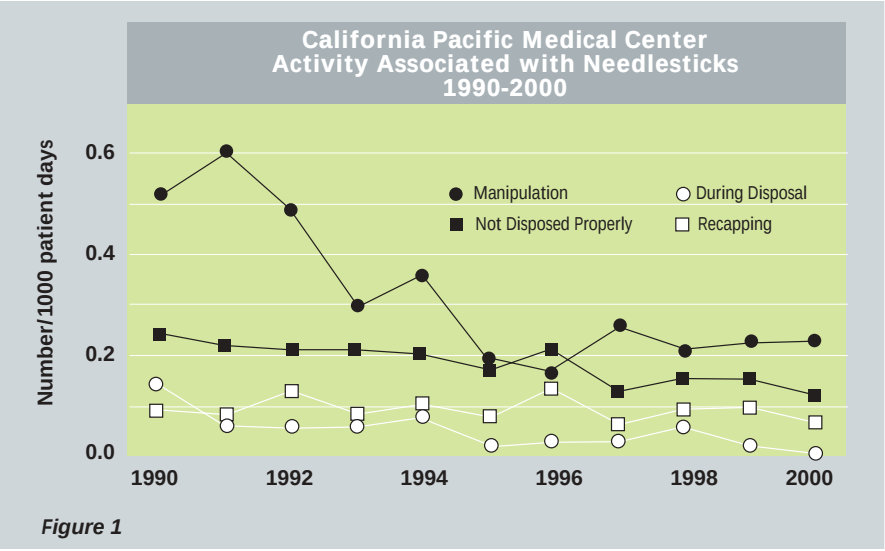


*Figure 1*

* Monojet Blood Transfer Dome

ter relies on part-timers, per-diems, and travelers who work very infrequently or for short periods to provide adequate staffing. Effective education required creativity and flexibility that led to the development of a "train-the-trainer" course. We developed an 8-hour course that includes an overview of bloodborne pathogens, occupational risk and risk-reduction, management and post-exposure prophylaxis of bloodborne pathogen exposures, and an interactive demonstration of all needle devices currently in place at our medical center. Our primary objective was to assure that each individual could demonstrate competence in order to role model and assist co-workers in his/her clinical area. These nurses were expected to provide just-in-time training to individuals who might have missed the opportunity to receive orientation prior to placement or assignment. We also learned that optimal training on devices with engineered sharps-

*Figure 2 SharpsCart (Kendall)*

injury protection requires actual handling of the product. Although viewing a video or observing a demonstration of a device may be somewhat useful, this approach has limited effectiveness, as it does not afford the nurse the ability to actually experience the safety feature. Adequate skill development requires time and practice.

## Management of NSIs

For years, a source of dissatisfaction for staff was the post-exposure management protocol that required a trip to the emergency department (ED) if Occupational Health (OH) was closed. An employee with an NSI was considered low priority compared to a patient in cardiac arrest. Elimination of one of the EDs as a result of the merger added insult to injury; employees now had to travel across town to begin the process of receiving post-exposure treatment for recent NSIs. We considered all our options and decided to train all nursing supervisors to be first-responders to an employee with an NSI. This required collaboration with the physicians in OH and Pharmacy Services. Formal training of nursing supervisors was initially conducted and is repeated periodically to assure competence. The supervisors are trained and authorized to assess the injury, determine appropriateness of HIV post-exposure prophylaxis, obtain baseline lab samples from the patient, and dispense prophylaxis, if appropriate. The supervisors are encouraged to consult the PEP National Clinician's Hotline (1-888-448-4911) before dispensing medication to assure that the correct drug is selected. Feedback from staff has been overwhelmingly positive primarily because they are treated expeditiously by compassionate, competent individuals who treat the event as the emergency it often is. The OH physicians conduct an annual quality-improvement analysis that has demonstrated that 100% of post-exposure management by nursing supervisors has been appropriate.

## Interpretation of internal data

Early in the '90s we made the naïve mistake of assuming that we were going to be able to determine device-specific injury rates. It is important to elucidate that rarely will there be enough data from a single facility to calculate rates of injury for specific devices that are statistically significant and can be used to determine the efficacy of one safety device over another. It is critical to use caution when interpreting rates. For example, in a Centers for Disease Control and Prevention (CDC) study of the efficacy of phlebotomy devices compared to conventional devices, the rate of injury for a conventional device was 3–4 injuries per 100,000 devices used. The rate of injury for the safety devices ranged between 0.9 and 3.1 per 100,000 devices used. If you wanted to show a statistically significant reduction in the rate of injury when comparing a conventional phlebotomy device to a safety device, you would need between 500,000 and 1.6 million devices in each group to have statistically significant data and to rule out the possibility that the difference occurred by chance alone (alpha 0.05; statistical power of 90 using $X^2$ Fishers exact test). If you wanted to compare the efficacy of one safety phlebotomy device over another, the number of devices in your sample would need to be even larger. Further complicating the issue of using rates to compare devices is the inconsistency in reporting injuries, the profound degree of underreporting (as high as 70% in some facilities), and the variations in reporting, all of which affect the accuracy of the data collected. For these reasons, we utilize our NSI data as only one piece of information to guide our sharps prevention program. We have learned to avoid calculating rates to compare devices because, unless we have huge numbers, they will rarely be able to provide an accurate picture of what is really happening.[4]

Internal data can be helpful to evaluate the circumstances that were responsible for an NSI. As shown in figure 1, NSIs due to recapping have declined at our institution in the past decade. This was a war that we never thought could be won, as recapping has traditionally been considered safer than the alternatives, especially by nurses who trained prior to the early '80s. We utilize this data as a way to acknowledge our staff and to reinforce positive work-practice controls.

## Keeping needlestick prevention on the radar screen

Recent tragic events in the U.S. have had a profound effect on the need to establish and maintain a constant state of emergency preparedness. We all swiftly assessed our ability to respond to a bioterrorist attack and developed policies and procedures to assure the safety of our staff. The infection-control practitioner and professional nurse need to recognize that periodic challenges—whether they are mad cow disease, anthrax, or smallpox—will require intense attention; this might obscure the necessity of consistently maintaining sharps safety. The California Pacific Medical Center Needlestick Prevention Taskforce assures center-wide awareness of activities by participating in our annual quality-improvement fair. A storyboard containing an analysis of internal NSI data is an effective way of demonstrating progress and opportunities for improvement. External agencies such as the Joint Commission for Accreditation of Hospitals and Healthcare Organizations (JCAHO) have traditionally been interested in viewing these boards as well.

## Summary

Developing a program to reduce occupational injuries from needles and other sharp devices is a huge undertaking. A successful program requires the leadership and support of management, an organization-wide commitment to safety, and enthusiasm among healthcare workers to overcome the inevitable obstacles encountered in initiating widespread change. Experience has

shown us that product evaluation, selection, and implementation can be extremely challenging, time-consuming, and costly. Needlestick-injury prevention is a challenge that must remain on the agenda of every healthcare professional.

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***Needlestick prevention — Continued from page 3***

- Do not recap, bend, break, or cut the needles.
- When the container is nearly full, seal it tightly, reinforcing the seal with heavy packing tape or duct tape.
- Put the container in the general garbage collection, NOT with recycling material.
- Label the container "not for recycling."
- Local trash-disposal authorities should be consulted to assure appropriate disposition of diabetics' sharps.

Commercially available sharps containers, similar to those used in hospitals, can be purchased from local pharmacies and durable medical equipment agencies. These containers meet OSHA requirements for safe disposal and are convenient for patients to purchase while purchasing other diabetes supplies. Diabetes educators and infection-control nurses should be familiar with the availability of such products to guide patients in their options for safe, convenient, and affordable disposal.

Some communities have programs to provide accessible and affordable methods for residents to dispose of their sharps. The community may have designated exchange sites where an approved sharps container can be purchased at a nominal cost. When the container is full, it is returned to the exchange site for proper disposal and another container is purchased. Resources are also available for individuals who cannot afford to purchase a container.[20] In other communities, registered sharps collection sites exist. Here, individuals can simply bring their sharps for proper disposal, as long as they are in a commercially available sharps container or an empty plastic laundry detergent bottle with a screw-on lid that is securely sealed with tape and labeled "biohazard."[21]

## Traveling with sharps

People with diabetes should always be conscious of infection-control practices when away from home. When soap and water are not available, the simple practice of using alcohol-based hand rubs and allowing them to completely dry will reduce personal risks of infections related to puncturing unclean skin. If there are not designated sharps containers in public bathrooms, the user should bring a small container, stored in a handbag or briefcase, to safely bring the used syringes and lancets home for proper disposal. Because sharps containers are typically larger than desired for travel, sturdy plastic containers such as a toothbrush holder or an empty medication container could be used to temporarily transport the sharps home. Once home, the individual can safely transfer the sharps into the permanent disposal container without touching the sharps.

Due to increased security measures since the tragedy of September 11, 2001 people with diabetes who are traveling may find increased scrutiny of carry-on diabetes supplies in airports. Passengers may board with syringes or other insulin delivery systems as long as they show documented medical need by having the insulin in the box that contains a pharmaceutical pre-printed label clearly identifying the medication as a prescription for the passenger. If passengers need to test their blood sugar levels, but do not require insulin, they can board with the lancets as long as the lancets are capped and brought on with the glucose meter that has the manufacturer's name embossed on the meter. Consultation with individual air carriers is recommended as each airline may have other requirements.[22]

## Implications for nursing practice

While needlestick injuries are commonly associated with nurses who are directly involved in injection administration or glucose monitoring, one should not forget other healthcare workers, such as housekeepers and laundry workers, who can be stuck through improper disposal or use of safety devices. Even the best of sharps devices is not foolproof if not used as intended. Healthcare providers should be educated about safety syringes and disposal devices to minimize the risk of injury while activating the protective sheath or disposing of the sharp.[23]

Healthcare professionals, including diabetes educators and infection-control nurses, can make an impact upon needle-safety and sharps-disposal practices of both healthcare professionals and individuals with diabetes. Measures must be taken to protect oneself, patients, other personnel, and the community. By understanding state and federal needle-safety laws, reviewing clinical practice guidelines, and becoming more aware of environmental and social problems resulting from improper syringe and lancet disposal, nurses can greatly influence sharps disposal behaviors. Using safer needle devices can prevent many needlestick injuries. Safer syringe devices cost about 28 cents more per needle; however, this is a nominal cost compared with the approximate $1-million associated with a serious infection resulting from a needlestick.[1]

Diabetes educators are in a key position to educate patients on proper sharps disposal

practices. Providing better access to disposal containers, distributing them during an office visit, or identifying convenient community resources may increase proper disposal of needles. Information from healthcare professionals is critical in making positive behavior changes. Through observation of people with diabetes in the community setting, the nurse can evaluate actual sharps disposal practices and reinforce proper disposal techniques when necessary.

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Sherry A. David, RN, BS, CIC, is a nurse epidemiologist at the University of Iowa Hospitals and Clinic, Iowa City, IA. Sherry's experience includes Certified Diabetic Educator (CDE) for 7 years in California and Iowa prior to her certification in infection control. This mix of experience provides an excellent springboard for an article on infection control and diabetes.

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***This continuing education activity has been awarded 1.5 contact hours by the Academy of Medical Surgical Nurses (AMSN). AMSN which is accredited as a provider and an approver of continuing education in nursing by the American Nurses Credentialing Center's Commission on Accreditation (ANCC-COA).***

Upon completion of this program the participant will be able to:

1. Describe three environment-related factors and three human-related factors that influence the risk of a sharps injury.
2. Explain the limitation of device-specific needlestick injury rates.
3. Discuss the value and limitation of internal needlestick injury rates.
4. Describe the key components of a successful needlestick prevention program.
5. Identify common practices used by individuals with diabetes mellitus that can put others at risk for bloodborne pathogen exposure.
6. Compare insulin syringes with safety features and alternative devices for insulin syringe usage.
7. List six (6) recommendations for safe disposal of sharps in the home/community setting.

1. Read *both articles*
2. Complete the post-test. (You may make copies of the answer Form).
3. Complete the participant evaluation.
4. Mail or fax the complete answer and evaluation forms to address below.
5. To earn 1.1 contact hours of continuing education, you must achieve a score of 70% or more. If you do not pass the test you may take it one more time.
6. Your results will be sent within four weeks after form is received.
7. **The fee has been waived through an educational grant from Kendall, a business unit of Tyco Healthcare.**
8. Answer forms must be postmarked by August 17, 2006
9. Mark your answers clearly with an "X" in the box next to the correct answer. **Please print clearly. Illegible writing will delay processing.**

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1. **Devices considered to be high-risk for transmission of bloodborne pathogens are:**
   A. scalpels
   B. needles used to administer an IM injection
   C. hollow-bore, blood-filled needles
   D. needles used to administer insulin

2. **Which is a true statement about engineered sharps safety devices?**
   A. they guarantee prevention of a needlestick injury
   B. they are not at all effective in reducing NSIs
   C. they are an important part of a sound needlestick-prevention program
   D. they eliminate the need to use a sharps container

3. **Important environment-related factors to consider when performing a procedure requiring a sharp are as follows:**
   A. clutter
   B. placement of sharps container
   C. lighting
   D. all of the above

4. **The most effective method of training staff on new devices is:**
   A. demonstration followed by return demonstration
   B. written materials
   C. video
   D. demonstration only

5. **An excellent resource for assistance regarding post-exposure HIV prophylaxis is available by calling:**
   A. 411
   B. 911
   C. 1-888-448-4911
   D. none of the above

6. **Device-specific NSI rates are:**
   A. easy for an institution to obtain
   B. imperative in order to justify implementation of a specific device
   C. virtually impossible for an individual institution to obtain
   D. none of the above

7. **Internal sharps injury data should be used to:**
   A. evaluate circumstances responsible for injury
   B. assist in decision-making about which sharps safety devices to implement
   C. prove a particular device's effectiveness
   D. a and b

8. **Which of the diabetes self-management skills is not associated with infection control:**
   A. lancet disposal
   B. meter cleaning
   C. recapping needles
   D. syringe disposal

9. **Another name for used diabetes supplies disposed of in the garbage is called:**
   A. medical waste
   B. diabetic waste
   C. biological waste
   D. contaminated waste

10. **Who is put at risk for a needlestick injury and possible exposure to hazardous diseases when diabetes supplies are not properly disposed in the home setting:**
    A. family members
    B. sanitation workers
    C. general public
    D. all of the above

11. **Specific practices that must be stopped to reduce the risks of needlestick injury include:**
    A. breaking off insulin syringe needles inside the syringe cap
    B. tossing syringes and lancets loosely in the garbage
    C. flushing syringes and lancets down the toilet
    D. all of the above

12. **When should an assessment of sharps disposal practices occur for individuals with diabetes:**
    A. only during the educational process when the individual is newly diagnosed
    B. when the individual is seen by a certified diabetes educator
    C. periodically when the individual sees a healthcare professional
    D. not needed if the individual reuses his/her syringes

13. **Patients who reuse insulin syringes should be taught:**
    A. recap the syringe carefully, using a two-handed method
    B. reusing syringes may affect the insulin dosage needed
    C. clean the syringe with alcohol before storing in the refrigerator
    D. consult with a health care provider before initiating reuse of syringes

14. **When the nurse administers insulin to a person with diabetes the following procedures prevent needlestick injury:**
    A. using an insulin syringe with an engineered safety feature
    B. recapping the needle if the sharps container is not in reach
    C. transferring the syringe to another professional closer to the sharps container
    D. inactivating the engineered feature of the insulin syringe when it is not needed

## Mark your answers with an X in the box next to the correct answer

| | A | B | C | D |
|---|---|---|---|---|
| 1 | ☐ | ☐ | ☐ | ☐ |
| 2 | ☐ | ☐ | ☐ | ☐ |
| 3 | ☐ | ☐ | ☐ | ☐ |
| 4 | ☐ | ☐ | ☐ | ☐ |
| 5 | ☐ | ☐ | ☐ | ☐ |
| 6 | ☐ | ☐ | ☐ | ☐ |
| 7 | ☐ | ☐ | ☐ | ☐ |
| 8 | ☐ | ☐ | ☐ | ☐ |
| 9 | ☐ | ☐ | ☐ | ☐ |
| 10 | ☐ | ☐ | ☐ | ☐ |
| 11 | ☐ | ☐ | ☐ | ☐ |
| 12 | ☐ | ☐ | ☐ | ☐ |
| 13 | ☐ | ☐ | ☐ | ☐ |
| 14 | ☐ | ☐ | ☐ | ☐ |

DO NOT WRITE IN THIS SPACE

**Resource Volume 1, No. 3**

**Score** ☐ **14**

## Participant's Evaluation

1. What is the highest degree you have earned (circle one)? 1. Diploma 2. Associate 3. Bachelor's 4. Master's 5. Doctorate

2. Indicate to what degree you met the objectives of this program:
Using 1= strongly agree to 6= strongly disagree rating scale, please circle the number that best reflects the extent of your agreement to each statement:

| | | Strongly Agree | | | | | Strongly Disagree |
|---|---|---|---|---|---|---|---|
| a) | Describe three environment-related factors and three human-related factors that influence the risk of a sharps injury. | 1 | 2 | 3 | 4 | 5 | 6 |
| b) | Explain the limitation of device-specific needlestick injury rates. | 1 | 2 | 3 | 4 | 5 | 6 |
| c) | Discuss the value and limitation of internal needlestick injury rates. | 1 | 2 | 3 | 4 | 5 | 6 |
| d) | Describe the key components of a successful needlestick prevention program. | 1 | 2 | 3 | 4 | 5 | 6 |
| e) | Identify common practices used by individuals with diabetes mellitus that can put others at risk for bloodborne pathogen exposure. | 1 | 2 | 3 | 4 | 5 | 6 |
| f) | Compare insulin syringes with safety features and alternative devices for insulin syringe usage. | | | | | | |
| g) | List six (6) recommendations for safe disposal of sharps in the home/community setting. | 1 | 2 | 3 | 4 | 5 | 6 |

3. How long did it take you to complete this home-study program? _____

4. Have you used home-study in the past? Yes ☐ No ☐

5. How many home-study courses do you typically use per year? _____

6. What other areas would you like to cover through home study? _____

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