

Reducing HealthCare Worker Risk of Sharp Object Injury through Safer Sharps Disposal

Abstract: The primary route of exposure to bloodborne pathogens among healthcare workers, (HCW), is accidental percutaneous injury caused by needles, sutures, blades, and other sharp objects, (sharps). In the United States, approximately 800,000 sharps injuries occur annually. According to CDC / NIOSH, as many as one third of all sharps injuries are related to the disposal process. Together with engineering controls, (safety needles), personal protective equipment, and training, improved sharps disposal safety is a necessary element of any comprehensive sharps injury prevention program.

Through careful selection of sharps disposal products, (access design, size, etc.), their appropriate placement within all healthcare settings, and with certain safe disposal practices for HCWs and facilities, risk of sharps injury can be reduced.

Introduction

Sharps collectors emerged as the first widely accepted safety device in the 1980's. As a majority of healthcare facilities began to use first generation sharps collectors, a reduction of sharps injuries was observed. Since that time, HCW safety concerns have grown, spurring HCW's, unions, and manufacturers to focus on the need for safer needle devices, culminating with recent legislation requiring wide use of needle safety devices. In its publication *Preventing Needlestick Injuries in HealthCare Settings*, NIOSH notes that along with the adoption of safer needle devices, healthcare providers must also consider their sharps disposal systems as important engineering controls, and that safe sharps disposal systems are a critical element of every sharps injury prevention program.

Though sharps collectors have been widely used since the 80's, and though safer needle device use is growing, research from NIOSH and other sources have indicated that as many as one-third of all sharps injuries are **still** related to disposal. Indeed, though newer sharps collector designs are emerging, and though safer disposal practices are known, most healthcare facilities have not reviewed and adjusted their sharps disposal **products, placements, and practices** in years.

How Might Existing Sharp's Disposal Systems Be Inadequate?

From the NIOSH publication *Selecting, Evaluating, and Using Sharps Disposal Containers...*

"The factors most often related to sharps injuries include the following:

- Inadequate design or inappropriate placement of the sharps disposal container
- Overfilling of sharps disposal containers
- Inappropriate sharps disposal practices by the user"

First generation patient room sharps collectors are open top designs that only marginally restrict unwanted access, and offer no overflow-inhibiting features after the fill level indicator. Many have wall-mounting cabinets that offer limited visibility to collector contents, increasing the chances of overflow. Most are mounted too high to be safely viewed and reached by HCW's according to NIOSH.

In addition to addressing potential product or placement liabilities, healthcare providers should consider taking advantage of newer sharps collector designs that maximize safety design features suggested by NIOSH, such as increased visibility, tamper resistance, ease of operation, handles, one-hand disposal, etc.

With sharps collector **products** or **placement**, healthcare providers should also review their sharps disposal **practices** and training for completeness.

Sharp object injury surveillance programs that investigate disposal data inputs can be used to help identify disposal related needs and circumstances. Safety audits of existing products, placement, and disposal practices are typically provided as a service by reputable vendors of sharps collectors and other safety products. Audit observations and recommendations can be an invaluable tool, and should be strongly considered.

Sharps Collector Standards

FOOD & DRUG ADMINISTRATION, regulates sharps collectors as Class II Medical Devices, (21 CFR 860.3). Manufacturers should be in good standing with FDA.

ISO 9001 is an international standard of good manufacturing practices for quality and R & D. Though not a requirement, ISO certification is a strong indication of commitment to quality, customer satisfaction and continuous improvement.

OSHA's Bloodborne Pathogen Standard 29 CFR 1910.1030(d)(4)(iii)(A) establishes minimum design performance elements for sharps collector PRODUCTS:

"Closable, Puncture resistant, Leakproof on sides & bottom, and labeled in accordance with paragraph (g)(1)(I) of the standard."

Regarding **Practices**, OSHA also states that sharps collectors shall be:

"Easily accessible to personnel..., Maintained upright..., and Replaced routinely and not allowed to be overfilled."

NIOSH, (C.D.C./ National Institute for Occupational Safety and Health), has published its guidelines for safe sharps disposal, which call for performance elements beyond OSHA's Bloodborne Pathogens Standard. Though not legislated, NIOSH has clearly described sharps collector design elements that contribute to HCW risk reduction:

Functionality Puncture resistant, durable, appropriate size & design to accommodate largest sharps used, closure is secure and minimizes exposure during closure.

Accessibility Easy to operate, facilitates One-Hand disposal, with guards that prevent hands from entering, **handles** to facilitate safe handling, removal from cabinets and transport, placement as close to point of use as possible, free of obstacles, away from wall switches, etc., clear of impact zones, and various other specific hazards. NIOSH defines the appropriate wall mount height to allow for HCW's view and safe access of collector door at typically 52" to 56".

Visibility Sharps collectors must be visible and recognizable, fill status should be completely visible and clear before using, fill status should be obvious under lighting at point of use.

Accommodation Ease of storage, assembly, intuitive, easy to use, should promote One-Hand disposal, mounting systems should be durable, stable, cleanable.

In addition to Functionality, Visibility, Accessibility and Accommodation criteria, NIOSH also calls for:

- A facility strategy for selecting appropriate sharps collectors based on a site specific hazard analysis of a number of criteria, (NIOSH Publication 1997-111 pg 6). . .
- Designation of an individual or group to be assigned the responsibility for regular monitoring and maintenance of sharps collectors. The designees should frequently and routinely monitor fill levels, and should be responsible for changing sharps collectors before they are overfilled.

OSHA Compliance Directive CPL 2-2.44D

Published in December 1999, the directive instructs OSHA inspectors on the proper enforcement of the Bloodborne Pathogen Standard. The compliance directive describes inspection criteria

from NIOSH Selecting, Evaluating, and Using Sharps Disposal Containers, (highlighted above), and refers inspectors to the publication as an inspection criteria tool. Appendices to this directive include sharps collector safety feature evaluation forms.

Other...

Various local or state codes and regulations may apply to sharps disposal practices in your area.

According to NIOSH, "No requirements exist for sharps disposal containers to meet Department of Transportation (DOT) certification for shipping containers. Sharps disposal containers are generally placed within DOT certified containers before shipping to a final disposal site." NIOSH publication 1997-111 sectionII.

Products

Considering existing minimum requirements for sharps collectors, (OSHA), more recent safe sharps disposal guidelines, (NIOSH), and substantial feedback from a large and diverse sample of healthcare providers, certain sharps collector product design features are emerging as preferred features among clinicians reviewing disposal systems:

Visibility Product features include a growing preference for clear sharps collector bases, largest available viewing windows in wall cabinets, clear tops, and clear 'high-tops' to maximize visualization of fill levels. These features help prevent dangerous overflow, and aid in identification of potential hazards before disposal.

Counterbalanced Doors for patient/exam room sharps collectors allow for increased tamper resistance, added security, and overflow inhibition. According to NIOSH, doors should facilitate one-hand disposal, and should accommodate the largest sharps waste used at the station, such as code drug syringes. Doors that require a secondary step to assure disposal are not passive, and are subject to periodic non-activation – incomplete disposal. Patient /exam room sharps collectors with counterbalanced doors should replace first generation open top collectors.

Temporary Closures between periods of use are accomplished by counterbalanced doors on patient room collectors. Easy to use, temporary closures should also be available on other categories of sharps collectors to provide added security against tampering and spills. For example, a phlebotomist should have the option of closing the tray sharps collector between blood draws, while an E.R. or O.R. should have the capability of temporarily closing large sharps collectors for security between cases.

Placement

First generation- open top sharps collectors are typically installed very high on patient room walls. This was intentionally done to keep open tops 'out-of reach'. However, recent research has identified mounting height as a critical factor in sharps disposal safety. Collectors that are too high do not allow for safe visualization, and so add to HCW risk. NIOSH describes an ideal mounting height as 52" to 56" from floor to collector opening.

Other general placement criteria include accessibility, visualization, and obstacle avoidance. Collector placement areas should be free of furniture or equipment that might impede access. Examples of inappropriate placements include corners of rooms, under sinks or in utility cabinets, near light switches, environmental controls, or where collector may be subject to impact from pedestrian traffic, swinging doors, etc.

Sharps collector wall placements that exceed NIOSH height guidelines, or that are otherwise inappropriately placed, add to

HCW risk of injury, and should be replaced as soon as possible. The occasion of replacement of wall mounts is an opportune time to review available sharps disposal systems. Often, newer wall cabinets with enhanced visualization windows or other desirable features are available. The expense and resource drain of a major sharps collector replacement/ repositioning project can often be borne by sharps collector manufacturers.

Practices

Healthcare providers should actively develop and implement safe disposal practices that maximize the protection from sharps injury that safety engineered sharps collector can deliver. Even the safest designs are ineffective when overflow or other abuse is allowed, or when non-sharps waste is disposed in sharps collectors, or when staff fails to follow product use instructions.

Examples of safe sharps disposal practices include:

- Designation of responsible individuals or group to ensure regular monitoring and maintenance of sharps collectors in every area. Designees should frequently and routinely monitor fill levels, and be responsible for changing collectors before they become overfilled. Practices should practically eliminate overflow.
- Facility protocols should prohibit placement of non-sharps waste in any sharps collector. Non-sharps waste, (gauze, tape, syringe package), adds to disposal costs and creates unsafe obstacles at collector openings.
- Sharps collector systems should be supported by staff education. Implementation of new systems must be supported by in-service of instructions for use in every department. Ongoing support should be provided as part of yearly sharps injury prevention training, and to support new hires. Sharps collector manufacturers and facilities should work together to deliver a safe sharps disposal education plan.
- Multi-functional reviews of available sharps disposal systems.

Summary Remarks

As sharps safety legislation and technology continue to evolve, so too will the sharps disposal industry. Sharps collectors are important safety engineering controls, and must be considered a necessary element of any sharp object injury prevention program. Where safer disposal PRODUCTS, PLACEMENTS, or PRACTICES are available, they must be pursued to enhance HCW safety. Healthcare providers should look to manufacturers for support in identifying needs, applying appropriate PRODUCTS and PLACEMENTS, and providing educational support.

References

CDC/NIOSH ALERT

Preventing Needlestick Injuries In HealthCare Settings

NIOSH pub. 97-111

Selecting, Evaluating, and Using Sharps Disposal Containers

OSHA

Bloodborne Pathogen Standard

OSHA

Compliance Directive 2-2.44D on Bloodborne Pathogen Standard

For Additional Information . . .

www.cdc.gov/niosh/homepage

BD Sharps Disposal Systems at 1.800.32.SHARP

Part of a Clinical Education Series on Medication Delivery provided by BD.

