

Safety in the Hospital Pharmacy

Prevent staff injury and exposure to toxic materials with safety devices

by Ron Stoker

When President Bill Clinton signed the Needlestick Safety and Prevention Bill into law it required OSHA to revise the decade-old Bloodborne Pathogen Standard. Many were surprised with the rapidity that OSHA responded to the challenge. When confronted with safety concerns of both patients and healthcare workers, many institutions seem at a loss on how to proceed. Many of them have implemented the use of some safety products, but feel like they have come to a brick wall. To them the problem of safety for patients and healthcare workers seems overwhelming.

The image of the safety problem has grown so big in their minds that they simply shut down and postpone research into the safety projects for several weeks. They become afraid to look at it. They think, “What should we do?” Institutions that run into this type of paralysis have an elephant on their menu, and it appears too big to eat!

Have you ever had an elephant on your menu? A problem that at first blush appears too big to swallow? We all have at one time or another. Elephants appear in all shapes, sizes and colors. But the safety of patients and healthcare workers seems to attract elephants, and many institutions desiring to be compliant with safety guidelines find an elephant or two on their menus.

So how do you plan on eating your elephant? For most individuals the simple answer is this: if you find an elephant on your menu, cut it up into a thousand little pieces and eat it one bite at a time! It is the only way that I know to face problems that are gargantuan in nature. Divide your problem into many small parts and focus on one piece at a time.

The staff of hospital pharmacies takes care of the medications for many patients. They are exposed to many medications. Those that are providing our pharmaceutical needs in hospitals need not be exposed to the drugs that they dispense for our benefit. Hospital pharmacies have traditionally been “safe harbors” against contaminated needlesticks because relatively few patients are actually treated in the pharmacy. Pharmacists are, however, subjected to a variety of occupational injuries and exposures. Many of the procedures that pharmacies are involved in can potentially result in personal and environmental contamination. Some of these injuries include accidental needlesticks, broken glass from

ampoules and exposure to a wide variety of toxic drugs including monoclonal antibodies, immunosuppressive drugs, antibiotics, antivirals and antineoplastic therapies (cancer chemotherapeutics.)

So how does a hospital pharmacy improve the safety of using such medications? Pharmacies that are located within hospitals differ considerably from drugstore pharmacies. Hospital pharmacies have more complex clinical medication management issues than community pharmacies. Hospital pharmacies contain a much larger range of medications than their community pharmacy counterparts. Many of the medications given in a hospital setting are single doses of medication. Hospital pharmacists and trained pharmacy technicians compound many of the products that are given to in-house patients. This complex process requires training of personnel as well as adequate safety products.

The proper use of safety products can protect hospital employees and others from these potential injuries. This article will break down the gargantuan safety elephant into several smaller chunks that can be digested so that they can be implemented by hospital pharmacies to reduce the risk of injuries and the unnecessary exposure to toxic medications.

Glass Ampoule Openers

Many medications come prepared in glass ampoules. Ampoules are small glass vessels in which liquids for injections are hermetically sealed. A typical pharmaceutical ampoule has a narrow neck between a cylindrical body and a conical tip. Ampoules are opened by snapping off the glass top at the neck. The scoring at the neck does not always break where it is intended. This is due to the glass remelting to some degree at the score line. When the cap is snapped off, glass chips can fly off, and a jagged or sharp edge can cut the hands of the healthcare worker. Some of the medication has to be discarded because of glass shards. In the past, healthcare workers would try to work around this problem by wrapping the glass with a towel or gauze, holding the vial upright and snapping it open at the score line. This procedure was not always successful. Safer products that remove the risk of broken glass cuts when breaking off the top of the glass ampoule are available. Examples of these products include:

Ampoule Opener Healthcare Logistics Inc.

The Ampoule Opener reduces the chance of finger cuts (see Figure 1). It has a small cutting blade inside that scores the ampoule stem to help ensure a clean break. It works with most sizes of ampoules and can be sterilized. For additional information on this product call 800.848.1633 or visit www.healthcarelogistics.com.

Figure 1.



SafeBreak™ MediDose Inc.—EPS Inc.

The SafeBreak™ is a disposal plastic fracture and safety collar. No glass filing of the ampoule is required. The use of gauze pads to protect hands becomes unnecessary as the ampoule is contained during the time of opening. The clinician simply swabs the ampoule head and fits the Safebreak snugly over the ampoule. The Safebreak Safety Collar is used to snap the “head” off of the glass ampoule. The ampoule and the Safebreak Safety Collar are disposed to prevent contamination. For additional information on this product go to www.medidose.com/catalog/ivpharm/safebreak.asp or call 800.523.8966.

Prefilled Syringes

The use of prefilled syringes has been growing at a rate of about 20 percent a year for at least five years. This is expected to continue for the foreseeable future. There is a great benefit to using prefilled syringes instead of the traditional method of aspirating medication from a vial and then injecting it. Several steps are required to reconstitute a drug if it is lyophilized, which also requires the use of a sharp needle. Prefilled syringes are available right off of the shelf and contain the exact deliverable dose. A number of companies have prefilled syringes. Some examples include:

- ▶ BD PosiFlush™ Pre-filled syringes (see Figure 2), www.bd.com/injection/products/posiflush;
- ▶ Prefill Flush Syringe from Tyco Kendall Healthcare, www.kendallhealthcare.com.

Figure 2.



Exposure to Medications

An important part of treatment for patients is the use of strong medications. Unfortunately, many of these medications have been associated with potential adverse health effects for the individuals who prepare, administer and dispose of these medications. Healthcare workers exposed most frequently to strong drugs are pharmacists, pharmacy technicians, nurses, physicians, operating room personnel, housekeeping personnel and laundry personnel. This group typically prepares drugs, administers them to patients and takes care of waste handling.

Reconstitution Devices

Many medications have been lyophilized and require reconstitution. Lyophilization is a process in which water is removed from the formulation by freezing the drug product in a vial and exposing it to a high vacuum under controlled temperature and pressure. This enables longer preservation of the drug without harming the potency. To be administered, a lyophilized drug must be reconstituted, the process of introducing a diluent to the drug. Reconstitution is the process of adding a diluent to the lyophilized drug to create a liquid medication at the required strength that can be administered to the patient with a syringe. These procedures have been done in the past by the use of a needle and a syringe. Newer methods are available that can remove that additional needle.

The following products are available from West Pharmaceutical Co. For more information in North America call 908.918.1015, in Europe call +45.8227.3029, or visit the company’s Web site at www.westpharma.com/products/medimop.asp.

Vial adaptors are the perfect solution for quick and safe transfer from vials.

MixJect® Transfer Device for Drug Reconstitution

The MixJect® system enables the safe, rapid and easy preparation of lyophilized drugs (see Figure 3). MixJect is a single unit for reconstituting a powder drug with a diluent prefilled syringe. The low-profile lock minimizes fluid path dead space. MixJect is preassembled with a client-specified syringe needle. Upon reconstitution, the drug is available for immediate injection with a dry integral needle.

MixJect is compatible with popular auto-injector devices. MixJect is ideal for specialty prescriptions, home healthcare, chronic use and hospital pharmacy drug handling. It is a unique product for one-piece preparation of a powder drug to be reconstituted by a diluent prefilled syringe. The MixJect is easy to use. After peeling the package and removing the product, the file is pierced with a plastic vial adapter. The syringe is connected to the female port, and the diluent is injected by pushing on the syringe piston. The file and syringe are then swirled to dissolve the entire lyophilized drug. The system is then turned upside down, and the drug is aspirated by pulling on the syringe piston. After removing the vial adapter and the vial, the needle is ready for its injection.

Figure 3.



Mix2Vial™ Needleless Reconstitution System

The Mix2Vial™ needleless system enables simple, fast, vial-to-vial transfer and mixing between two vials for the reconstitution of lyophilized drug products (see Figure 4). The reconstituted drug is available for immediate aspiration into the syringe used for injection. The system is available with an in-line filter. The Mix2Vial system is vacuum-powered and is easy to use for rapid transfer. The Mix2Vial can be configured to allow the transfer from a variety of vial sizes.

The Mix2Vial needleless system is a dual-sided device that allows rapid transfer of the diluent into vacuum powder vials. The mixed drug is easily transferred into a syringe. After opening the package and removing the product, the Mix2Vial is used to pierce the diluent vial followed by the powder vial. The diluent flows automatically into the powder vial. The diluent side is then disconnected, and the reconstituted drug is then ready for aspiration with a syringe.

Figure 4.



Vial Adapters

Vial adapters are the perfect solution for quick and safe transfer from vials, allowing convenient, optimal quantity (see Figure 5). Vial adapters enable rapid drug transfer and reconstitution. Vial adapters are the cost-effective solution for the safe and rapid transfer and reconstitution of drugs between vials. Adapters enable the optimal aspiration of mixed and reconstituted drugs. They also provide a needleless system that reduces needlestick opportunities. In addition, there are vented vial adapters that provide a unique design that allows sterile inbound air and outbound droplet capture. The dual-channel valve allows for pressure equalization. The silicone rubber valve with Luer-compatible connector opens only when connected to or compressed by standard Luer slip or Luer lock syringe.

Figure 5.



Needleless Transfer Device for Rapid Reconstitution

The Needleless Transfer Device facilitates the rapid transfer of a diluent into vials (see Figure 6). The Needleless Transfer Device provides fast mixing between two vials into an injection syringe. One device allows a closed system preparation.

To use, simply place the powder vial on the table and insert into diluent vial. The diluent should flow into the drug vial. The handle is turned toward the drug, and the drug is removed. The syringe filled with air is connected, and air is injected into the drug. The system is turned so that the drug is on the top. The drug is aspirated into the syringe.

The needleless transfer device enables the rapid transfer of a diluent into vacuum powder vials for mixing and drug reconstitution. The use of this device allows for closed system preparation. The device works with or without a vacuum in the powder vial.

Figure 6.



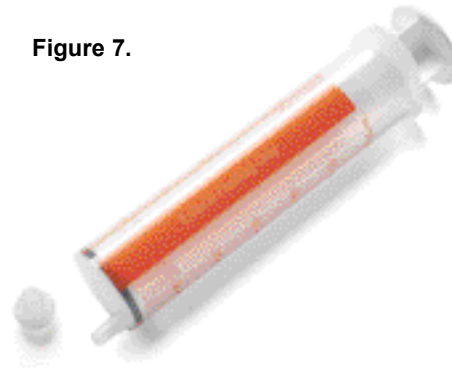
Products for Preparing, Handling, Packaging and Administering Fluid Medications

There are a number of products that can assist hospital pharmacy staff workers in preparing fluid medications and in ensuring proper administration. The following products are from Baxa Corporation. Further information can be obtained by calling 303.690.4204 or by visiting their Web site at www.baxa.com.

Enteral Syringe

Using an Enteral Syringe prevents wrong route administration (see Figure 7). It is the only syringe designed for and labeled “Enteral Feeding Only.” The unique non-luer tip will not mate to standard luer connections. It provides a snug, secure fit to oral connections on feeding tubes.

Figure 7.



Kwik-Vial™ Containers

Kwik-Vial™ Containers are a simple tool for safe unit dose medication repackaging (see Figure 8). Their foil lid cannot be opened and resealed without detection, and the easy-fill vials eliminate repetitive motion stress injuries. Unit dosing offers medication safety for the patient and ease-of-use for the staff.

Figure 8.



Mark-a-Dose™ Labels

Prevent the wrong fluid drug dose by marking the exact dose with Mark-a-Dose™ labels (see Figure 9 on page 110). Use these specialty labels to indicate the intended dose on a luer or oral syringe. They can also be used to help caregivers at home deliver the correct dose.

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Figure 9.



Figure 10.



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Oral Labels

Oral Labels add a measure of safety for delivering oral fluids in syringes by specifying “oral use only” (see Figure 10). Labels can be used as is or overprinted with patient and drug information. Use to prevent wrong-route administration of nonsterile fluid drugs.

ShrinkSafe® Paralytic ID Band

The ShrinkSafe® Paralytic ID Band provides a forcing function when accessing paralytic drugs and enhances your facility’s safety initiatives by removing risks that may result in medication errors associated with inadvertent use of paralytic agents (see Figure 11). The paralytic ID band adds specialized labeling and a forcing function to promote safety in routine administration.

Figure 11.



Tamper-Indicating Tip Caps

Tamper-Indicating Tip Caps protect drug doses from tampering during storage and delivery (see Figure 12). The three-part, luer lock, latex-free caps come apart upon removal, leaving a red ring to indicate tampering. Assures drugs are delivered safe and sealed.

Figure 12.



Conclusion

Over the past few years, serious shortages of nurses, pharmacists and physicians have started to pose a threat to patient safety. There has been a mass exodus of these professionals just at the time when the baby boomer generation is aging and requiring more from the healthcare system. The needs are outstripping the care and services that our health practitioners can safely supply.

Dramatic shortages of pharmacists have left vacancies in community pharmacies, public and private hospitals and federal facilities. It is important, therefore, to protect and give our pharmacists support in the prevention of injuries and exposure to toxic materials. They should not have to receive “a taste of their own medicine.” †

Ron Stoker is the founder and executive director of ISIPS, the International Sharps Injury Prevention Society, and is a frequent contributor to Managing Infection Control magazine. He speaks frequently at national and international meetings on sharps safety, hand hygiene and infection control issues. He is coauthor of the “Compendium of Infection Control Technologies.” For more information on the Compendium go to www.medicalsafetybook.com.