

Retracting from Traditional Needles

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Introduction

As estimated by Modern Healthcare, "As many as 600,000 times each year, healthcare workers across the country risk infection when needles, scalpels, or other sharp instruments break their skin" (Becker, 2000). Of these estimated 600,000 annual accidental needle sticks, as many as 39 workers are infected with HIV. Another 4,400 contract one of several forms of hepatitis, according to the International Health Care Worker Safety Center at the University of Virginia (Hensley, 1999). It is also estimated by The Service Employees International Union (SEIU) Nurse Alliance that enforcing the use of safety syringe devices would prevent more than 80 percent of the needle-stick injuries (Safer Needles, 2003).

Why should programs be enforced to implement retractable style safety syringes in medical environments? With all the new laws and regulations that are being enforced, fines can be issued to practices for non-compliance towards implementing programs that enforce the use of safer needle devices. After considering the advantages that retractable syringes have to offer, it is a wonder to why no more than 20 states, as of December 18, 2002 have followed the success that California started back in 1998 when they passed legislation calling for safer devices (Legislative Update). This document mentions why it is important that the rest of the U.S., as well as other countries, follow suit and begin their own safety syringe programs.

Retractable Syringe and How it Works

A retractable or safety syringe acts in the same manner as a traditional syringe. However, after the complete amount of fluid has been injected into a patient, the needle of the syringe quickly retracts protecting the user from accidental needle sticks. When drawing blood, there is also a safety syringe that enacts a safety barrel over the exposed needle, protecting the user from harm once again.

Features of Self Re-Sheathing Needles

The basic principle of the self re-sheathing needle is as follows; the needle is removed from the patient and a barrel around the outside of the main casing slides forward and protects the exposed needle. After the barrel is in the forward position, it is locked in place providing a guard around the used needle. The barrel is moved by an internal spring that is released when the syringe is fully depressed, or all of the fluid is drained from the reservoir.

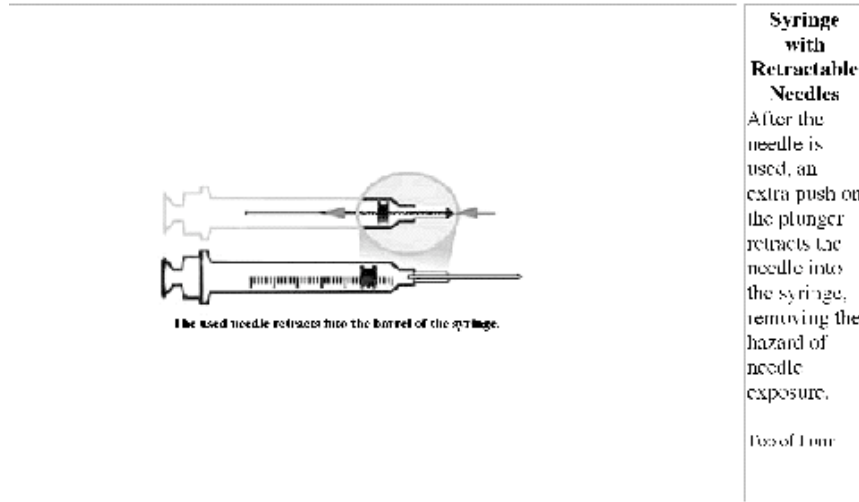
Figure 1: Self Re-sheathing Needles



Features of Syringe with Retractable Needles

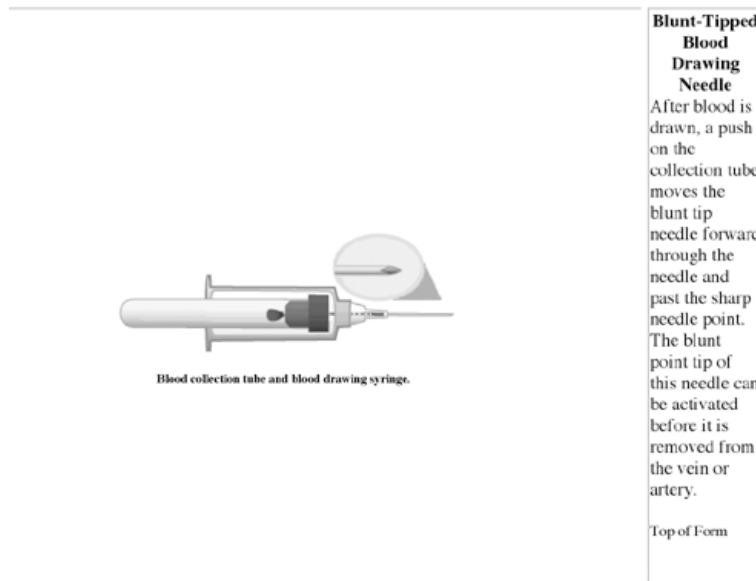
A syringe with a retractable needle works similar to a self re-sheathing needle. The main advantage is that the needle fully retracts into the body of the syringe, thus saving space for disposal and eliminating parts. After the needle is fully depressed and all fluid is injected into the patient, a spring or gas cell enacts the needle and retracts it fully into the body of the barrel where it is locked in place. The only variation in the design is whether or not a spring or a gas cell is used. Both perform the same task, however LOM, the producer of gas cell syringes claims, that their product retracts in a more controlled measured manner, producing less tissue tear and blood spatter (Berg, 2002).

Figure 2: Syringe with Retractable Needles



Features of Blunt-Tipped Blood Drawing Needle

The blunt-tipped blood-drawing needle is used in place of traditional syringes. The device works similar to conventional needles, until the correct or full amount of blood is drawn from a patient. Then the user must push the tube forward to cause a barrel to depress around the outside of the exposed needle. This process can be done before a complete draw or is automatically done as part of the motion when tube becomes full.



(All illustrations provided by NeedleSticks / Sharps Injuries, 2003)

Protecting Users

As previously stated, it is estimated that 600,000 healthcare workers are injured each year due to accidental needle sticks. Because so many cases remain unreported, this number has been estimated as low as 384,000 cases, and as high as one million annually. The Centers for Disease Control and Prevention (CDC) estimates that 57 percent of needle sticks go unreported (Smart, 2000). With so many accidents happening to nurses, doctors, and phlebotomists (specialists who draw blood), it is important that safety needles become more common and eventually replace traditional syringes.

Accidental Needle Sticks Do Happen

Accidental needle sticks can happen when one least expects it. In 1997, Lisa Black was accidentally stuck by a needle when a startled patient jerked his arm away during a routine injection. Although the odds of this patient carrying a blood disease were low, Black still underwent monthly tests and an emergency regimen of AIDS drugs. After six months of living in fear, they were sure that she was clear of any infection. However, three months later she was hospitalized for severe headache and found she tested positive for hepatitis C (Hensley, 1999).

After being diagnosed with hepatitis C, Black found herself unable to work but willing to talk. "If that needle-based system was not there, I wouldn't have been stuck," said Black. "If there's no needle, there's no needle stick" (Hensley, 1999). Unfortunately the hospital in which Black was stuck had a safer system available, but it was not required. Because no regulations had yet been in effect, the hospitals lack of use for a safer device was not enforced at the time of the accident.

Service Employees International Union

The Service Employees International Union (SEIU) Nurse Alliance is a group that fights for a safer work place, and has helped lead the way to the passing of the federal Needle-stick Safety and Prevention Act (Safer Needles, 2003). Since the act was passed, more than 24 states have implemented safer needle laws. Although safer needles prevent more than 80 percent of sticks, currently only about 15 percent of hospitals use them (Becker, 2000). Even after legislation is passed, it is difficult to enforce all hospitals to comply with these regulations. Today there are over 250 needles that contain features such as protective shields or mechanisms that automatically retract (recently approved by the FDA). However, it is up to the hospitals to decide whether or not they should use these products.

Cost Savings

It is estimated that a single case of HIV can cost \$100,000, and one case of hepatitis C involving a liver transplant, can cost as much as \$750,000. Hospitals and clinics need to look at the potential cost savings associated with the possibility of their employees being stuck accidentally. As pointed by the SEIU, "Even where no infection occurs, it costs up to \$3,000 to treat an injured

health care worker with prophylactic drugs when they've had a high-risk exposure (Safer Needles, 2003)."

VanishPoint Cost Analysis

To gain a more accurate reflection of cost savings associated with a safer needle policy, the manufacturers of the VanishPoint medical syringe developed a matrix comparing the cost of an existing syringe, at a Dallas hospital, to their own product. The Dallas hospital currently spends \$0.05 per syringe while the VanishPoint product costs around \$0.50 per syringe. Although there is a \$0.45 price advantage in the traditional syringe, after comparing all the variables into the equation, a cost savings of \$0.25 per syringe were found. This is due to three major areas in which VanishPoint's product soars over the traditional syringe. The first, most significant advantage is the cost of inflationary risk per syringe. This is the cost incurred for testing after a needle-stick occurs, as well as lost time and wages. The second cost advantage lies within the cost of treatment after a person is found to have contracted something. Since a large majority of sticks show negative to infection, this number is significantly lower than the mandatory testing that goes along with each accidental stick. The third and final advantage, the disposal cost of their product is cheaper (Cost Analysis, 2003).

Figure 4: Syringe Cost Analysis

Annual Costs	1,070-Bed Dallas Hospital	
	Existing Cost	Cost Using VanishPoint® Product
Volume of 3cc Syringes Purchased	427,600	427,600
Inflationary Risk Cost % of Salary	1.52%	-
Accidental Needle Sticks (ANS)	250	-
Probability of an ANS	0.000565	0
No Transmission of Infectious Disease	0.98235	0.98235
Transmission of Non-Fatal Disease	0.01765	0.01765
Transmission of Fatal Disease	0	0
Cost to Treat an ANS		
No Transmission of Infectious Disease	500	500
Transmission of Non-Fatal Disease	10,000	10,000
Transmission of Fatal Disease	-	-
Cost per Syringe Purchased		
Cost of Inflationary Risk per Syringe	0.52	-
Cost of Treatment for ANS per Syringe	0.11	-
Cost of Disposal per Syringe	0.05	0.03
Cost of Training & Prevention per Syringe	0.08	0.03
Purchase Price of Syringe	0.05	0.5
Total Cost of Syringe	0.8	0.55

Finding Price Advantages

The VanishPoint product, which costs \$0.50 per syringe, was compared against a traditional syringe, which costs \$0.05. However, according to the International Council of Nurses (ICN), the average cost of a retractable syringe was \$0.24, while the cost of an average conventional syringe was \$0.07 (Sew News, 2001). While there are advantages and disadvantages to every type of retractable syringe on the market today, a \$0.26 difference is a dramatic saving.

California Finds Success

In 1998, California became the first state to take measures towards safer needle products. Although the legislations did not require the state to use specific products, it did require that all establishments and facilities who used needles to enact programs. All products that were used must be proven safer than their existing devices. It was not limited to just syringes. Scalpels, IV

lines, and other sharp devices were included (Noble, 2002). Since implementation, many hospitals and clinics have estimated cost savings, and all have reported lower cases of accidental needle-sticks.

Associated Costs Declining

As with almost every new product on the market today, the cost compared to conventional or existing products is usually dramatically more expensive. However, as these products become more commonplace and the machinery used to produce the product starts to pay for itself, the price almost always comes down. As Hensley writes in *Modern Healthcare*, "Manufacturers commonly charge twice as much for the safety products as for the traditional models they replace. Device makers attribute the price differences to startup costs, low manufacturing volume, and additional parts. They say prices will decline as demand picks up."

Laws and Regulations Enforce Use

If hospitals can't see the health and cost advantages of switching over to programs that use safer syringes, they'll surely get the idea when new laws and regulations come into place. The Occupational Safety and Health Administration (OSHA) has begun to incur penalties of up to \$7,000 per violation to large group practices, clinics, and hospitals who are not complying with their new regulations (Garvin, 2002). Even small practices have been the target of such fines. Although most fines until now have been around \$700 per violation, there is still the possibility of higher fines (Garvin, 2002).

Specific Regulations

To be in compliance with the new laws and regulations, practices will have to abide by new regulations. Although broad, they entail using safer medical devices complying with certain regulations. For example, using engineered sharps and needleless systems whenever feasible, evaluating and selecting safer devices, and maintaining a sharps injury log (Southwick, 2001). Health care workers see this legislation as a way to standardize the law and drive compliance at a quicker pace.

How Workers Can Ensure Enforcement

Because the vast majority of OSHA inspections are prompted by employee complaints, it is necessary for healthcare workers to voice their opinions if programs are not being followed to comply with the new regulations. Only a small amount of inspections are done at random, based on a computer-generated list of offices and hospitals. It is especially important for workers apart of smaller practices to complain because quite often they are not even on the list.

Disposal Advantages

When a typical syringe is finished being used, the one who performed the injection is then required to dispose of the device in a safe manner.

Typically, at most hospital or medical environments, there are safe needle disposal sites. However, because the world is not a safe place and accidents can happen, employees can find themselves in danger of accidental needle sticks even after needles have been disposed. "While disposing of uncapped needles into sealable containers (sharps containers) sounds like an ideal solution to the needle-stick problem," stated Ziff Medical Devices. "In actual practice, not all needles are properly disposed of, and needles stuffed into overfilled containers may still be dangerous." In fact, according to the International Health Care Worker Safety Center, 10 percent of needle sticks are caused due to improper disposal, while another 12 percent deals with disposal-related causes. Overall, disposal issues make up nearly one-quarter of all reported accidents.

Saving in Terms of Training and Disposal

Cost saving can also be found through the disposal of safety syringes. The disposal per syringe is typically half as much as traditional syringes, while the cost of training and prevention is also significantly less (Cost Analysis, 2003). As stated in Market Analysis done by Zif Medical, "Recapping the needle accounted for a higher percentage than any other activity at 14.1 percent." The advantage of not having to recap needles is directly reflected in the amount of necessary training when dealing with retractable devices compared with the traditional syringe. Disposal costs are typically less because retractable devices take up one-half the amount of space in a sharps container (Southwick, 2001). The ability of fitting twice the amount of syringes saves time changing the containers, as well as disposal cost associated with waste management.

Conclusion

Today more than ever, hospitals are starting to see the advantages of using retractable medical syringes. With more than 20 states now enforcing laws and regulations of safer devices, it won't be hard for other states to see the advantages. One of the problems associated with the hospitals today, according to Bill Borwegen, is that health-care's culture "focuses on the needs of patients but not of workers" (Southwick, 2001). Hospitals must start recognizing the advantages of implementing programs and practices, not only to protect their patients, but to protect their employees as well. Today, through new laws and regulations, healthcare facilities are getting the push they need to start implementing their own programs. Furthermore, if protecting their employees from infection and even death isn't push enough, hospitals can find cost savings in retractable devices as well as in disposal and training advantages. Hopefully, other facilities will implement programs of their own after seeing success of hospitals using safer needles in the past couple of years.

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