Daniel Price
Development of a Facility Based Employee/Patient Safety Program
November 23, 2002

Project Standards and Specifications:
Employees Safety has recently become a major focus in the healthcare industry due primarily to two specific legislative statutes that were designed to protect healthcare workers from the incident of needle-stick injuries during the course of patient care services.

- AB 1208 Healthcare Protection Act (Midgen Law). Needle/Sharp Safety effective date July 1st, 1999. Office of State Healthcare Administration (OSHA, 2002*)*
- SB 3067 Needle Stick Safety and Prevention Act. Effective date April 18, 2001 (Federal Register, 2002*)*

The primary reason that these bills are created and passed were to reduce the incidence of needle-stick injuries that lead to cross contamination patient to healthcare worker infection from both HIV and Hepatitis B and C. (OSHA,2000; Federal Register, 2002)

Development of a hospital based employee safety program (ESP) was planned during the 1st quarter 2000 in response to recent revisions in the Leadership (LD Standard .4.4.2) and Performance Improvement (PI Standard .3.3.1) standards by the Joint Commission of Accreditation of Healthcare Organizations (JCAHO). The standards are specifically designed to ensure that the hospital is maintaining a proactive strategic risk reduction program that focuses on the following:

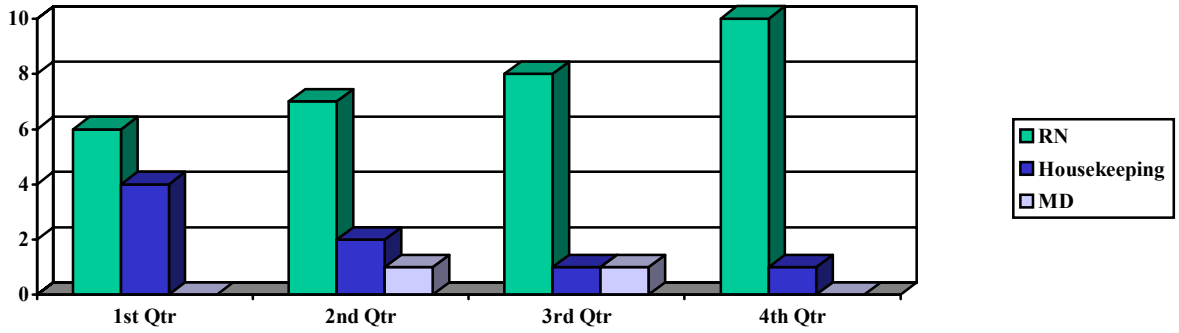
- ❖ Shift in purchasing requirements eliminating needle based syringes to a needless system
- ❖ Employee education in the use of the new needle-less devices.
- ❖ Aggregation of data relative to worksite needle stick injuries to determine if effective training was achieved (Joint Commission of Accreditation of Healthcare Organization, 2002).

As in any shift in employee process and procedure, there were a number of challenges in achieving good results. Based on an analysis of this project in comparison to the materials presented in the text, the following points were highlighted:

- A basic analysis of aggregate information related to needle-stick injuries show some misunderstandings in perception of graphical data.
- The process of employee vigilance contributed to the difficulty in changing procedures related to the new syringe devices
- Identification of safety signage and employee ability to decipher instructional diagrams and text (Wickens & Hollands, 2000)

Analysis of Pre-Program Employee Injuries:

In preparation for AB1208 (OSHA, 2002), the facility did an analysis of employee needle-stick injuries. Incidence rate averages three (3) injuries per month or nine (9) per quarter. Of these nine, an average of six (6) or 66% were due to used or infected needles (other 33% were injuries from unused needles). Seven (7) out of nine injuries (77%) were nursing staff and the remaining two (2) were housekeeping staff stuck through trash bags. Initial aggregate data was analyzed using a simple line graph:



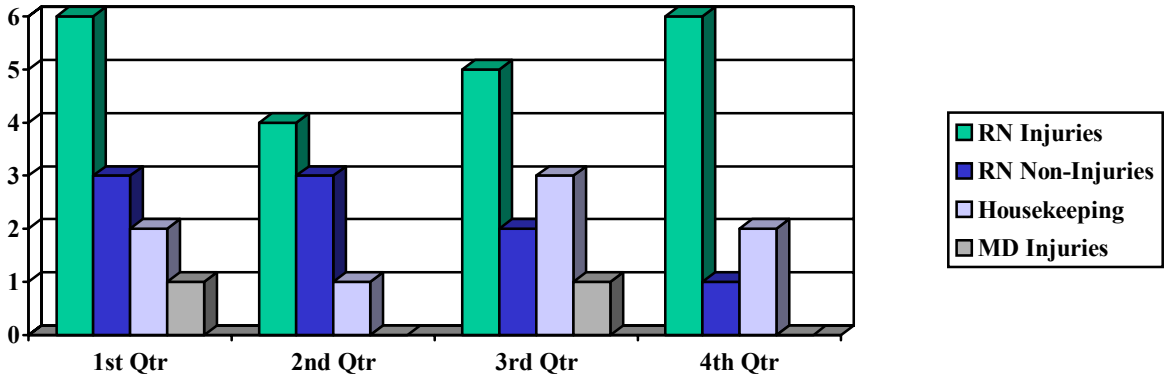
Representative statistics, however, were misleading in that for the nursing staff, the infected needle injury rate averaged at approximately 66% whereas for the housekeeping staff, 100% of needle sticks were used/infected needles. Upon initial review of the data, there were two significant, but false, conclusions:

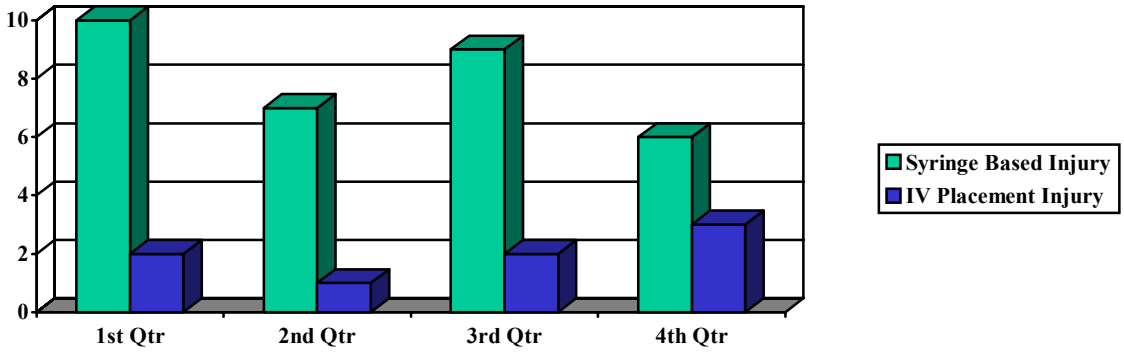
- There is a low significance in the injury rate when compared to total doses given per year (36,360/39 = 0.107%)
- There is even a lower significance due to the relatively smaller number of injuries for housekeeping staff.

Due to the false conclusion and bias in data analysis, the initial recommendations by the team was to forego investigation of needless systems overall. The following factors also contributed to this bias:

- Actual task was not considered. Data was only relative to doses by syringe. The graph does not address those needle stick due to IV line placements, and infers that the injuries by the housekeeping staff (through trash bags) equal those done by the RN during the actual dosing.
- Over-simplification of the data leads one to believe that the nursing staff is at higher risk for injury overall, whereas the housekeeping staff is at high risk for an infected injury. Data analysis does not display this factor.

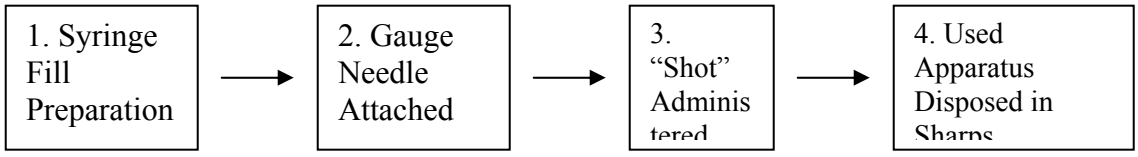
The preliminary team recommendation was rejected out of the fact that AB 1208 (Osha, 2002) mandated an action plan by January 2000. Further review of the data raised the above stated points and additional data aggregation through encoding multiple graphs addressed each factor succinctly:



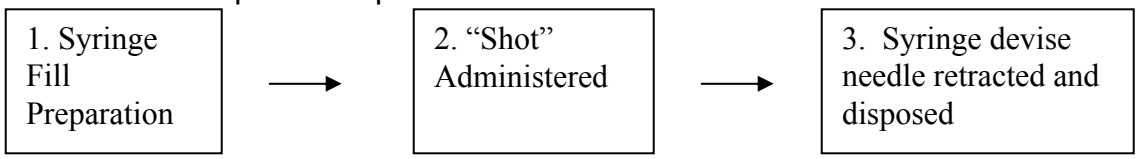


Task Analysis:
The second factor that the team analyzed was the actual task procedure involving the use of needles to deliver medication doses or supply patient IV hydration. This presents a prime opportunity to address vigilance. The standard procedure by which a medication is administered via subcutaneous route (a shot

in the fatty part of an arm or flank) or by push (directly into the vein) is routine following the below stated process:



Step 2 represents those incidents that a "clean" or unused needle-stick will occur. Steps 3 and 4 represent those incidents at risk for contaminated needle-sticks. Analysis of actual incident reports indicated that in 8 out of 10 injuries, the RN stated a loss of attention to the procedure. When these incident reports were revisited with interviews, it was commonly reported that the procedures of administering a shot was "so routine" that the nurse was no longer paying much attention to detail and the risks involved. The new procedure using the needle-less syringe reduces at least one step in the procedure and simplifies to process thus reducing loss of operator vigilance. Conversion to the new needless product is represented in the following process, eliminating risk in step 2 for placement of the needle and step 4 for disposal:



Task Identification and Training:

Under the mandates of AB 1208 (OSHA, 2002), all acute healthcare facilities were required to plan conversion from needle use syringes to so-called needle-less devices. These devices are grouped into two types: retractable syringes and plastic tube ports.

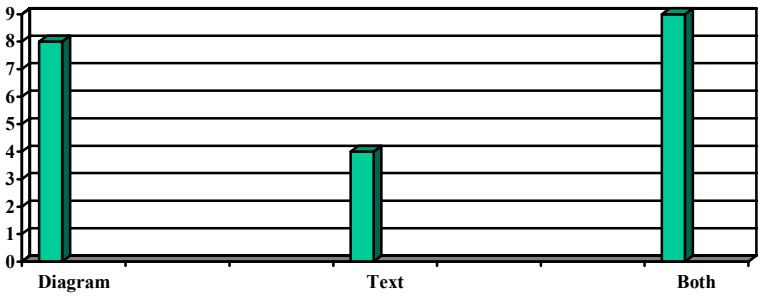
ESP Needle-less Device Program						
Increment	**Standard**	**Quality**	**Pharm.**	**Lab**	**Nrsg**	**Admin**
Team Planning	LD.4.4.2 and PI.3.3.1	♦				♦
Policy Review	LD.4	♠	♦		♠	♦
Staff Education	LD.4 and Nursing	♠		♦	♠	♦
Safe Procedure Evaluation	Nursing	♠			♦	♦
Approval post successful test run	LD.4.4.2 and PI.3.3.1	♦				♦

Legend: ♦ = Primary Responsibility
♠ = Support Responsibility

Once the team determine course of action for the syringe use redesign process, tools for staff education were reviewed. The facility contracted with Becton-Dickinson (BD) products for the needle-less systems products. Included in the contracted services, BD also provided on site training by their vendors. Training materials included both text based and visual diagrams depicting how the products work. The idea behind the visual diagrams was to provide ease in use and understanding how to retract they syringe once a shot had been administered. The text instructions were found to be too involved and lengthy to be effective in a quick training session (Becton & Dickinson, 2000). Initial planning only included a two-day training window (a bi-annual skills day training session). The team elected to review the training based on a preliminary session by conducting a competency review based on staff understanding of the instructions. Since the test competence review would not be using any form of contaminated needles, risk of infection was not a factor. The test group was asked to use the new retracted devices based on the following:

- Use the device using only the visual diagrams
- Use the device using only the text instructions
- Use the device using both visual and text instructions

In a test run of 10 personnel each, the team reviewed the following findings:



Correct interpretation of the instructions occurred 4/10 (40%) for the text-based instructions, 8/10 (80%) for the visual diagrams, 9/10 (90%) for both. Based on these findings, the team electing to initiate the following changes to the training protocol:

- Remove needle-less systems training (1 hour session only) from the Skill Day agenda. Budget for seminar days to set up 4 hour increment training for all relevant staff
- Base training on both the visual and text instructions, but modify and simplify the text based on the following:
  1. Bullet point step-by-step instructional criteria. Reduced wording.
  2. Revised vocabulary. Removal of terms related to more complex procedures not done at the facility with the devices.
  3. Minimized text v. diagrams per guide. Only 5 guides were needed (syringes, central lines PICC Lines, IV ports and heparin lock devices).

Project in Review:

Post analysis of the ESP team findings did show that needle-stick injuries were reduced by 55% over the next year. More significantly, contaminated needle-stick injuries were virtually eliminated for the housekeeping staff (through trash bags). The revised training instructions were successfully use for all future bi-annual competency updates and reviews.
It was also noted that due to the greater variation in transition to the new procedures, there was a lower level of vigilance decrement and greater attention to detail when shots or IV s were given.

References

Wickens, C.D & Hollands, J.G. (2000). Engineering Psychology and Human Performance, Upper Saddle River, NJ: Prentice Hall.

Becton & Dickinson (2000). BD Product Catalog. Ontario, Canada Becton and Dickinson.

Federal Register, 2002. United States National Archives and Records Administration Website: www.archives.gov/federal_register

Joint Commission on Accreditation of Healthcare Organizations. (2002). 2002 Hospital accreditation standards: Accreditation policies standards intent statements. Oakbrook Terrace, IL.

Occupational Safety and Health Administration (OSHA), 2002. Website www.osha.gov