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# Implementing Safety Devices: Two Nurses Share Their Experience

*At Iredell Memorial and Children's Hospital of Seattle, the conversion to safety has presented numerous challenges and taken years of sustained effort—but the results are worth it: declining sharps injury rates*

*By Jane Perry, M.A., and Janine Jagger, M.P.H., Ph.D.*

OVER THE PAST DECADE, HEALTHCARE facilities across the U.S. have been transitioning to safety-engineered needle devices—a process that rapidly accelerated after the Needlestick Safety and Prevention Act was passed in November 2000. Two nurses who have spearheaded safety device implementation at their facilities shared their experience with us: Pam Gill, RN, BSN, the HIV/HBV Prevention Nurse at Iredell Memorial Hospital in Statesville, North Carolina; and Diane Riggert, RN, MPH, COHN-S, manager of occupational health services for Children's Hospital and Regional Medical Center in Seattle, Washington. Iredell Memorial Hospital is a locally owned, not-for-profit, 247-bed acute-care hospital providing a variety of inpatient and outpatient services. Seattle Children's Hospital is a 200-bed teaching and research facility and the only regional pediatric referral center in a four-state area. Pam has worked at Iredell Memorial for 18 years (prior to her current position, she worked in intensive care and nursing education). Diane has been at Seattle Children's for 11 years.

## **Iredell Memorial: Creating a Culture of Safety—From the Top Down**

Pam Gill is in a fortunate position: the top-level administrator at Iredell Memorial—S. Arnold Nunnery, president and CEO—has been

the facility's strongest advocate for needlestick prevention, and the main force in creating a "culture of safety" at Iredell, according to Pam. "He established the position I currently hold, HIV/HBV prevention nurse, in 1991 [Pam has held the position since 1994] in order to emphasize the importance of staff safety and provide a focus for the institution's exposure prevention efforts." Backed by Iredell's board of directors, Nunnery has made sure there is an adequate budget for purchasing safety devices and personal protective equipment, and has emphasized the responsibility of unit managers to actively promote exposure prevention efforts.

Iredell got an early jump on the conversion to safety devices: by late 1991, it had needleless IV access and a safety IV catheter in place, and gloves and faceshields were standard equipment for clinicians at the bedside or in exposure-prone situations. In 1994, Iredell established a multidisciplinary HIV task force to review exposure incidents and make recommendations for prevention; it included a product committee, with representation from all clinical areas, to evaluate safety devices. The product committee made a list of safety devices that needed improvement and conventional devices that had no safety alternative. It chose new sharps con-



*Pam Gill, RN, HIV/HBV Prevention Nurse, and S. Arnold Nunnery, President & CEO, Iredell Memorial Hospital*

tainers with features that helped prevent overflowing and entry trays designed to keep workers' hands outside the container. Nunnery, with a team of nurses, walked floor to floor to find the best location for the containers in each patient room, as close to point-of-use as possible.

As the institution's point person for safety conversion, Pam is responsible for gathering information on current and emerging safety technology and assisting clinical staff in selecting, evaluating and implementing



*Iredell Memorial Hospital, Statesville, NC*

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new products. Once safety devices are introduced, she monitors them to ensure they are being used correctly. She also recommends changes in training, policies, and procedures that would aid in reducing exposure risk, and helps investigate employee exposures to blood and body fluids with the aim of improving the institution's needlestick prevention program.

Iredell's materials manager is a key member of the HIV Task Force; his expertise has been invaluable, says Pam, in searching for, and maintaining stock of, safety products—particularly when back order situations arise. Because he is actively engaged in the conversion process he understands its complexity, and that it requires time for training and education in order for staff to become competent users of new devices.

The participation of frontline clinical staff has also been critical. For Pam, this means keeping channels of communication open and building trust so they feel free to talk to her if questions or problems arise during the implementation process. If a staff member has trouble with a device that could potentially lead to an exposure, Pam issues an alert warning users to be vigilant and re-

port problems. After issuing the alert, Pam contacts the manufacturer to inform them of the problem. If an actual exposure occurs, an alert is sent to all staff with

details about the event (other than the injured employee's identity), and prevention tips, if appropriate, from the worker involved. The staff can also report "near misses." Pam says that over the last five years staff members have become increasingly comfortable with—even proactive about—reporting potential device-related hazards or other safety issues. This is an important measure, she believes, of the institution's success in creating a culture of safety.

Hearing from staff in all clinical areas is important because sometimes a similar safety risk may exist in different departments. For example, Iredell's respiratory therapy personnel found that when workers performed arterial blood gases (ABGs), the non-dominant hand, used to guide the needle by feeling for the artery pulse, was at risk for a rebound-type sharps injury. A similar rebound risk existed in the oncology department, where Huber needles are commonly used for accessing implanted IV ports (the non-dominant hand is used to hold the port in place while inserting or withdrawing the needle with the other hand). In both cases, injury risk increases when the worker has difficulty inserting or withdrawing the needle or when the patient moves inadvertently. At the time these risks were first identified by Iredell staff, no safety devices were available for these specific procedures.

The way Iredell dealt with this problem illustrates both its proactive approach to safety and the ingenuity of its staff. Clinicians in the affected departments, together with members of the HIV taskforce, worked with staff from the occupational therapy department to analyze the mechanics of each procedure, looking for ways to reduce risk—what OSHA calls "work practice

### **Safety conversion and risk reduction strategies— Tips from Iredell Memorial:**

1. Include the facility's materials manager as an active participant in the safety device selection and implementation process.
2. Use creative problem-solving and network with other facilities when encountering a new safety hazard or when a safety device isn't commercially available.
3. Hold a facility-wide annual review of safety devices; invite device manufacturers to participate and demonstrate correct use of their device.

controls." But it was an employee from respiratory therapy who actually designed a protective hand device that could be used for both ABGs and Huber needle procedures. (The employee is currently trying to patent the device.) It was subsequently made available wherever the procedures were performed. Once safety-engineered Huber needles became available, Iredell implemented them and found that rebound sticks from this procedure were completely eliminated. An ABG safety syringe that provides protection to the non-dominant hand during use

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has not yet been developed; for during-use protection, Iredell staff continue to use the protective hand device and have had no ABG-related sticks as a result.

Until manufacturers develop safety devices or products for all the specialty areas and procedures that exist in hospital settings, finding safety solutions will sometimes be a matter of ingenuity, as in the above example, or of creative networking with colleagues. For example, Pam was contacted by a colleague at another facility after an employee in its dialysis department sustained a sharps injury while trying to access a peritoneal fluid bag with a conventional syringe; the ports on the dialysis bags do not allow for needleless or recessed needle access. Iredell had already identified this risk, and Pam recommended their own practice of using a safety needle with a shorter needle length than a conventional one and a protective feature that could be engaged as the needle is withdrawn from the port. Pam reports that a manufacturer is interested in designing a needle-free way to access dialysis bags, and has sent engineers to Iredell to investigate.

Pam emphasizes that staff in each clinical area should be empowered to take responsibility for their own safety. At Iredell, this is accomplished by having safety committees at the departmental, as well as the institutional, level. The surgical department has its own full-time HIV/HBV prevention nurse, as well as a safety taskforce composed of operating room (OR) nurses and surgical technicians; the taskforce includes a surgeon-liaison—very important, since OR exposures frequently occur when surgeons pass instruments to assisting personnel.

The laboratory, endoscopy, and home health areas also have their own safety committees. All clinical departments have annual competency reviews on high-risk procedures and devices, and staff must attend a yearly “Sharps, Spills, and Splashes Review,” which includes hands-on demonstrations—assisted by product representatives—of how to correctly use a variety of safety devices. Having product reps present at the meeting also gives staff an opportunity to ask questions or voice concerns about specific safety devices.

Iredell has now largely completed the conversion to safety de-



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vices; the one device category that remains a challenge is suture needles. Iredell purchases and stocks blunt-tip suture needles—which are sharp enough to penetrate internal tissue such as muscle and fascia, but not sharp enough, in most cases, to pierce skin—but they haven't yet been widely adopted by surgeons there. Pam hopes this situation will gradually change, however; the HIV/HBV prevention nurse for the OR has persuaded a key surgeon to use blunt suture needles on a trial basis and provide her with feedback.

Iredell started using EPINet as its sharps injury surveillance system in 1997. In 1999, its average annual sharp-object injury (SOI) rate was 26 injuries per 100 occupied beds. Pam reports that their 2002 data show a 35% decline in the SOI rate, to 17 injuries per 100 occupied beds. She attributes this reduction not only to Iredell's successful transition to safety devices, but also to an overall concern for employee safety that, after 10 years, now permeates the institution and drives its staff—from the top down.

## Seattle Children's Hospital: Successes—And Challenges

Children's Hospital and Regional Medical Center in Seattle (known as “Children's”) is ranked by *U.S. News & World Report* as one of the top children's hospitals in the country; it provides care for infants, children, and adolescents up to 21 years old in 54 pediatric specialties. It also serves as the pediatric referral center for a large region encompassing Washington, Alaska, Montana and Idaho. Recently, the main hospital has provided record levels of care—12,000 admissions, 28,000 emergency room visits, and more than 180,000 outpatient visits per year.

The hospital is the primary pediatric teaching facility for the University of Washington School of Medicine, and has an extensive research program. Specialty services include a Level IV (highest level) infant intensive care unit (ICU) and a pediatric ICU; cardiac and thoracic, as well as general, surgery; neurosurgery; bone marrow and organ transplant; and diagnostic and therapeutic services for children with HIV.

As the nurse manager for occupational health services at this complex institution, Diane Riggert oversees a wide range of safety programs for its staff of 3,000. Included among



*Children's Hospital and Regional Medical Center, Seattle,*

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her responsibilities has been the conversion to safety-engineered sharp devices—in itself a complicated and multi-faceted process. What has the process been like for her?

“Overwhelming and very challenging at times. It can be hard to keep up with all the new safety devices that are constantly emerging on the market,” Diane acknowledges. To aid in the process, she established a safety sharps taskforce in 1999, which planned and initiated the transition to safety; members included the director of central services and the nurse-educator who chaired the nursing products committee. Utilizing its sharps injury data to guide implementation, the committee focused, in the beginning, on the highest-risk devices—those used for venous and arterial access. Now that the transition to safety is well underway at Children's, the taskforce has been disbanded, but a standing committee on employee health and safety, which includes equal numbers of elected and management representatives, continues to meet monthly. It reviews work-related injuries and illnesses, addresses staff concerns about safe work conditions, and monitors on-going implementation of safety devices. It reports to the hospital's executive safety commit-

tee and the infection control central committee.

When a worker sustains a sharps injury and files an incident report, occupational health services (OHS) analyzes the data to determine if it was caused by an unsafe work

practice, such as failure to use—or to activate the protective feature on—a safety device, or failure to properly dispose of a used sharp in a sharps container. In order to encourage prevention efforts and effective use of safety devices, OHS sends a copy of the incident report to the employee's supervisor and asks the supervisor to respond with an action plan. With a 66% response rate, the memos have been an effective way to create dialogue with unit supervisors and actively engage them in the process of risk reduction.

One of the challenges Diane faced in the conversion process was the perception among staff that they were at lower risk of infection from bloodborne pathogens because they dealt exclusively with a pediatric population. This sometimes translated into resistance towards implementing safety devices, particularly among physicians. But Diane reports that much progress has been made, with time and education, in overcoming this hurdle. An increased focus on needle safety on the part of physicians' professional groups, as well as published accounts of physicians and surgeons who have become infected with a bloodborne pathogen from an occupational exposure, have helped change physicians' attitudes regarding use of safety devices. Some of the most difficult clinical staff to win over have begun to accept that

the process is both necessary and inevitable—because using safety devices reduces their exposure risk, and because it is OSHA- and JCAHO-mandated.

### *Anesthesiology: Coming on board*

Diane found that among physicians, anesthesiologists and surgeons were the most resistant to switching to safety devices—a common experience at hospitals across the U.S. In part this is because the safety alternatives in these specialty areas have required adaptations in technique; and, specifically at Children's, because the available safety devices aren't always well-suited for pediatric patients, particularly the smallest ones. But Diane reports that the director of clinical anesthesia, Jeremy Geiduschek, M.D., has become very active in working with her to “change the culture” among his colleagues. He meets with product representatives to look at new safety devices, and reviews incident reports and makes appropriate recommendations for prevention.

One anesthesiologist in particular, who has experienced numerous needlesticks, has been a real advocate for safety devices—and that, says Diane, is invaluable. “Physician support is absolutely key in this group.” The anesthesiologists at Children's “are now looking, on their own, for safety IV catheters that will work for specific pediatric applications,” such as placing arterial lines (the safety IV catheter they tried didn't meet their criteria for initial flashback). They haven't been able to find a safety device that is well-suited for caudal injections (i.e., spinal taps and block anesthesia). For cases such as these, Diane has developed an exemption form to document why a safety device isn't being used; OSHA says the reasons must be related to patient safety or lack of market availability of an appropriate device. She

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keeps the exemption form with the exposure control plan for that area.

Facility-wide, Children's implemented a rule that whoever uses a sharp is responsible for its immediate disposal in a sharps container; for anesthesiologists, this may require keeping a portable sharps container with them so they don't have to get up to dispose of the needle—or leave it on a tray for someone else to deal with. Such changes have taken time to implement, but their efforts are paying off, with significant reductions in sharps injuries among anesthesiologists over the last four years.

### *Safety in the OR: Work in Progress*

Seattle Children's has 12 surgical suites and performs, on average, 13,000 operative procedures per year. With 86 full-time equivalent employees on its OR, anesthesia and recovery room staff and a large number of surgical residents and fellows, it is "an extremely busy service and a very unique environment," according to Diane. This makes it one of the most challenging in terms of implementing safety devices. "Sometimes you feel like an uninvited guest" when trying to introduce safety devices and educate staff about needlestick prevention, Diane observes, "but you have to be persistent." And again, enlisting a safety "champion" is crucial. In this case, as in anesthesiology, Diane was lucky to have top-down leadership: the chief of pediatric surgery, Robert Sawin, M.D., has been very supportive of efforts to implement safer devices and practices, and appointed an OR administrator to head the process. Diane does most of her communicating with

Dr. Sawin through e-mail because he's usually too busy for face-to-face meetings, but this arrangement works well; what is key is his interest and support. He includes exposure prevention and employee safety issues on the agenda in surgical staff meetings, and this has opened channels of

### **Safety conversion and risk reduction strategies— Tips from Seattle Children's:**

1. In the anesthesiology and surgical departments, enlist at least one physician (preferably the chair or director) as a safety champion to help promote safety device implementation.
2. Document exemptions to implementation of safety devices in the facility's exposure control plan.
3. To avoid injuries to central supply staff, make sure all sharp devices and equipment used in the OR are properly prepared for reprocessing.

communication and motivated others in the OR to actively pursue safety as well.

Diane found it helpful to introduce surgeons to the book *Advanced Precautions for Today's OR*, by Mark Davis, M.D.: "Of course, hearing the safety message from a fellow surgeon gives it additional weight, and the book's detailed information on prevention strategies in the OR has been very useful."

When Diane, along with members of the OR's safety taskforce, analyzed sharps injury data for the surgical services, they found that

suture needles accounted for about half of injuries. They also found that in a significant proportion of cases surgeons were being stuck by their residents (i.e., while the resident was suturing and the surgeon-in-charge had his hands in close proximity to assist or instruct). They discovered that there hadn't been a consistent protocol across all the surgical services for training residents in suturing techniques; since then, practice has been standardized and more focused training provided. As a result, injuries from suture needles have been reduced by 50%.

"It's important not to overlook safer work practices; for some procedures or areas, that can play a major role in reducing sharps injuries," says Diane. She reinforced the importance of the "neutral zone" concept to OR staff and found that, in the following quarter, there were no injuries related to passing of sharp instruments during surgery. Diane hopes this technique will be widely adopted by all the surgical services and staff, although she notes that some surgeons have resisted no-hands passing because it requires them to look up from the surgical site in order to place the instrument in the neutral zone. Surgeons need to be convinced, however, that when they don't use safer practices and devices, they create a risk to personnel around them from passing-related and other injuries; they need to take responsibility not only for their own safety but that of their staff as well. Diane finds that they also need to be educated that suture needle injuries are not their "fault" or somehow due to improper technique, but rather are "the inevitable result of working with a sharp instrument in very small, tight cavities and spaces."

Like Pam Gill at Iredell, Diane has tried to interest surgeons at Children's in adopting

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blunt-tip suture needles, but—as at Iredell—it remains a challenging area. The surgeons at Children's say they are not appropriate for internal tissue in pediatric patients and would compromise patient safety. Tissue adhesives have not found favor as a substitute for suturing in the OR, although they are commonly used in the emergency department.

OR data from Children's revealed that scalpels were also a significant source of sharps injuries. A disposable scalpel—which can reduce injuries by eliminating the need to detach the scalpel blade after use—was tried but rejected, except for initial skin incisions, by most surgeons. A safety scalpel that recently came on the market has been more favorably received.

Diane has encountered some unique safety issues in the OR, particularly related to reprocessing of the wide array of devices and equipment used in surgical settings. For instance, after receiving a complaint from central supply (CS), she found that OR staff weren't removing the blade from a device used to incise the ear drum before sending it to CS for reprocessing and, as a result, CS personnel were being injured. In another case, the pin on a device used in orthopedic surgery wasn't being removed by the OR prior to reprocessing, and it too was causing injuries in central supply. After consultations with Diane, CS staff began sending immediate feed-

back, with photographs, to the OR if they received equipment that hadn't been properly prepared for reprocessing. This notably reduced exposure incidents in that area.

Children's is now in the process of decentralizing safety device implementation: each clinical department will assume responsibility for seeking out and evaluating emerging safety technology relevant to its area of practice. Before conducting a product evaluation, however, departments will need to have the device approved by the hospital's safe medical device committee. The nursing products committee coordinates the training and education for new safety devices prior to facility-wide implementation, and central supply monitors them once they are in use. OHS continues to track progress in exposure prevention through incident reports and participation on the nursing products committee.

Although it has been an arduous process, Diane is "grateful to all the staff at Children's who have worked together in implementing safety devices." She notes with satisfaction that, as a result of their combined efforts, "we have seen a significant reduction in the number and severity of our sharps injuries." In two of the highest-risk categories—phlebotomy needles and peripheral IV catheters—Children's is close to 100% in converting to safety, and major progress has been made in most other device areas as well. But "we still have work to do," according to Diane. As sharps injuries go down, splashes to the eyes and mucous membrane account

for a larger proportion of exposures: "Data indicate that up to two-thirds of these incidents can be avoided by routinely wearing faceshields when maneuvering lines, suctioning respiratory secretions, intubating or irrigating. So using faceshields is a safety practice we will focus more attention on in the future," she says.

## Conclusion

The example of these two very different hospitals—Iredell Memorial and Seattle Children's—show how much can be accomplished through the dedicated efforts of occupational health and safety professionals such as Pam and Diane, the leadership and support of key administrative and clinical staff, and the cooperation of frontline healthcare workers across the full spectrum of clinical areas encompassed by a modern healthcare facility. The complexity of such institutions means that the implementation of safety devices cannot be the responsibility of one person—or one committee or one department—alone; it truly must be a collective effort on the part of all those who will benefit from the protection safety devices afford. □

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