GUEST EDITORIAL

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Infection Control Issue: Understanding and Addressing the Prevalence of Unsafe Injection Practices in Healthcare

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Needle and/or syringe reuse and the improper use of medication vials by healthcare professionals have been identified by the Centers for Disease Control and Prevention (CDC) as "never events," preventable healthcare errors that should "never" occur. However, since 2002 numerous outbreaks of hepatitis B and C, which resulted from the reuse of needles and/or syringes and the use of contaminated vials, have left the CDC, healthcare professional associations, patients, and other stakeholders in the US healthcare system concerned that the old adage "never say never" might more aptly describe the current state of infection control as applied to injection practices.

The Problem Defined

Over the past 30-plus years, as research detailing the transmission of various bloodborne pathogens has increased, healthcare systems and its practitioners have sought ways to reduce the incidence of infections occurring through intravenous routes. At the time, it was not uncommon in certain practice settings to draw medication into a sterile syringe, inject that medication through an intravenous port, change the needle, then using the same syringe, draw up additional medication and administer this medication to another patient using the same syringe that was used on the previous patient. In response to the increasing pool of evidence regarding bloodborne pathogen transmission, infection control standards and guidelines were developed, adopted, and disseminated by the CDC and other regulatory agencies, as well as medical and nursing professional associations, including the American Association of Nurse Anesthetists (AANA).[1]

Despite having the knowledge that reusing needles or syringes from one patient to another is not acceptable practice, clinicians continue to reuse needles or syringes in various ways that still pose great risks to patient safety (Table 1). Solving the reuse problem is made even more challenging because actions that constitute reuse, and healthcare professionals' understanding of and consensus on what is safe technique, are not always as obvious as a provider reusing the same needle on multiple patients. The hepatitis C outbreak in Nevada that was first reported in February 2008 had more

- **July 2002:** An anesthesiologist in Brooklyn, New York, is accused of infecting 19 patients with hepatitis C by allegedly contaminating medication vials through the reuse of needles (*The Record*, Bergen County, New Jersey).
- **September 2002:** A nurse anesthetist supervised by an anesthesiologist at a pain clinic in Norman, Oklahoma, allegedly infects 52 patients with hepatitis C through the reuse of needles and syringes (*The Daily Oklahoman*, Oklahoma City, Oklahoma).
- **November 2002:** Eighty-one patients treated at an oncology clinic in Fremont, Nebraska, are infected with hepatitis C, allegedly due to the reuse of syringes and saline bags on multiple patients (*Associated Press*).
- **October 2007:** An anesthesiologist is accused of reusing syringes on an unspecified number of patients at a surgery center in Bloomington, Indiana. At least 2 test positive for hepatitis C (*Herald Times*, Bloomington, Indiana).
- **November 2007:** Reports surface out of Long Island, New York, that an anesthesiologist is under investigation by the New York State Department of Health for allegedly reusing syringes to draw up medicine from multidose vials and exposing thousands of patients to bloodborne pathogen infection (*Newsday*, Melville, New York).
- **February 2008:** Nevada health officials close the Endoscopy Center of Southern Nevada in Las Vegas after 6 patients are diagnosed with hepatitis C. The outbreak is traced back to nurse anesthetists allegedly reusing syringes and contaminating single-use vials of medication (*Las Vegas Review-Journal*, Las Vegas, Nevada).
- **March 2008:** An anesthesiologist working at a gastrointestinal clinic in Las Vegas is observed by health inspectors reusing syringes and potentially contaminated vials of medication on multiple patients (*Las Vegas Sun*, Las Vegas, Nevada).

Table 1. Reuse Cases Reported in Media, 2002-2008

subtle origins, spurring debate and demonstrating the range of opinions that apparently exists among healthcare professionals concerning what exactly is safe practice. According to the investigation report of the Nevada State Health Division,[2] it is believed that the patients at the Endoscopy Center of Southern Nevada were exposed in the following manner:

- A syringe (not a needle) that was used to administer medication to a patient was reused on the same patient to draw up additional medication.
- The process of redrawing medication using the same syringe could have contaminated the vial from which the medicine was drawn with the blood of the patient.
- The vial, which was not labeled for use on multiple patients, was then used for a second patient (with a clean needle and syringe).
- If the vial was contaminated with the blood of the first patient, any subsequent patients given medication from the vial could have been exposed to the bloodborne pathogens.

Health officials began notifying more than 40,000 patients that they should seek testing for hepatitis and HIV. Media coverage expanded, public outrage grew, and the investigation widened to include unannounced site visits by health inspectors across the state. Despite this highly charged atmosphere, less than a month later health inspectors observed Scott Young, MD, an anesthesiologist working in a gastrointestinal clinic in Las Vegas, reusing syringes and potentially contaminated vials of propofol on multiple patients.[3] Christopher Millson, MD, a Las Vegas-based anesthesiologist, defended Young in an interview with the *Las Vegas Sun* newspaper:

> …while Young was not following the recommended practices, his case appears much different from what occurred at the Endoscopy Center of Southern Nevada, because Young was injecting into a 'high-port' IV line, relatively far from the patient's vein, minimizing the risk of blood backflow. In comparison, the Endoscopy Center patients' injections were occurring in IV ports at the arm, he said. While it's not recommended to reuse Propofol, the likelihood of its hosting infection is extremely slim if the vial is consumed swiftly.[3]

Millson's "high-port" defense was swiftly rebuffed in the same article by the senior epidemiologist for the Southern Nevada Health District, but his comments serve to demonstrate the apparent lack of consensus in the healthcare community as to proper aseptic technique when injecting medications.

Identifying, understanding, and reaching consensus on all possible scenarios in which infection can be spread through unsafe injection practices is a key step toward the CDC, healthcare professional associations, drug and product manufacturers, and other stakeholders developing an effective, universally supported plan to eliminate infectious disease outbreaks due to needle and/or syringe reuse and the improper use of medication vials.

Prevalence of Reuse

How common is needle/syringe reuse and the improper use of medication vials?

There have been no studies specific to the scenarios that played out in Nevada. However, it is unlikely that the 2 incidents of contaminating medication vials by reusing the same syringe on the same patient, and then using the remaining contaminated medication in the vial for other patients, were isolated events.

The reuse of needles/syringes, on the other hand, has been researched previously, most recently in 2002. In response to a hepatitis C outbreak in Norman, Oklahoma, involving a nurse anesthetist supervised by an anesthesiologist, the AANA contracted with an independent marketing research firm, Cooper Research, Inc, of Cincinnati, Ohio, to conduct a telephone survey of anesthesiologists, other physicians, Certified Registered Nurse Anesthetists (CRNAs), other nurses, and oral surgeons, to determine provider attitudes and practices concerning reuse. Data was collected via structured telephone interview (N = 500) from members of these groups, with each group having equal representation of the total. The survey results indicated needle or syringe reuse was more prevalent than initially anticipated.

Applications	%
Same patient	35
Intravenous tubing	8
Emergencies	2
Intramuscular/subcutaneous injections	2
Different patients	1
Do not reuse	63

Table 2. Needle Syringe Use: Applications
Percentages add up to more than 100% due to more than 1 answer from respondents, as well as due to rounding.

The percentage of healthcare providers self-reporting needle or syringe reuse overall (primarily on the same patient) was 42% of anesthesiologists, 18% of CRNAs, 15% of oral surgeons, 9% of other nurses (registered nurses or licensed practical nurses), and 9% of other physicians. The most common situation where healthcare providers tend to reuse needles or syringes was on the same patient (35%), followed by reuse with intravenous tubing (8%). Overall, 1% of respondents admitted to reusing the same needle or syringe on different patients (Table 2); anesthesiologists were the highest individual group at 3%. Extrapolated out, 1% of anesthesiologists, CRNAs, other physicians, other nurses, and oral surgeons equals thousands of healthcare providers who may be reusing needles and/or syringes on multiple patients.

Respondents were asked whether there were any circumstances when

it is acceptable to reuse needles or syringes, with 42% reporting "yes." Among the individual groups there was a wide disparity of answers: Only 15% of nurses stated that there are circumstances when it is acceptable, as opposed to physicians (34%), CRNAs (47%), oral surgeons (48%), and anesthesiologists (65%). Same-patient use was the most common circumstance identified (69%), followed by emergency situations (9%), and drawing/mixing medications (8%).

Significantly, more than any other healthcare providers surveyed, anesthesiologists (51%) indicated they believe the reuse of needles or syringes is an acceptable practice, followed by oral surgeons (26%), CRNAs (25%), physicians (22%), and nurses (11%). The order for responses to the question "Would you allow anyone to reuse a needle or syringe on yourself or your family member?" was consistent with the response order for the preceding question, with 45% of anesthesiologists indicating this would be acceptable, followed by oral surgeons (31%), CRNAs (26%), physicians (17%), and nurses (12%). Based on this data, it could be surmised that, at least back in 2002, if a healthcare provider truly believes that reusing needles or syringes is acceptable, that healthcare provider would not be concerned about being treated this way or having a family member treated this way.

Attacking the Problem

As it did in 2002 following the Oklahoma incident, the AANA took aggressive action in the wake of the earliest reports of the hepatitis C outbreak in Nevada to correct infection control problems related to unsafe injection practices by healthcare providers, including CRNAs. Likewise, the CDC was moving quickly to respond to the situation in Nevada. The 2 organizations blended their efforts on April 4, 2008, when AANA representatives met with CDC officials in Atlanta, Georgia, to review the infection control problems that led to the Nevada situation and other recent infectious disease outbreaks around the country, and to develop plans for preventing their recurrence.

The AANA and CDC agreed that this is a critical patient safety matter that will require the cooperation of the nation's many healthcare professional associations, drug and product manufacturers, and regulatory agencies such as the CDC and Food and Drug Administration (FDA) to correct. Difficult issues will need to be addressed and solutions agreed upon, among them proper sterile technique for injections across all specialties, consistent labeling of medication vials, and best approaches for educating healthcare professionals in the area of infection control. The 2 organizations agreed that situations involving needle and/or syringe reuse and the improper use of medication vials are preventable and should be "never-events."

Key among the many plans formulated at the meeting is the agreement between the AANA and CDC to cosponsor, along with other stakeholders, a national summit meeting to address the appropriate handling, administration, and labeling of parenteral medications.

In another significant step toward addressing the infection control issues illuminated by the Nevada situation, the AANA arranged a meeting with FDA officials on July 8, 2008. As the August issue of the *AANA Journal* was going to press, the meeting had not yet taken place, but the participants had been identified and agenda topics outlined. Among the topics to be covered: (1) Examine issues regarding FDA-approved medication vial labeling, as well as approved medication handling instructions relative to CDC, AANA, and other safe practice standards and guidelines, and develop recommendations. (2) Examine issues associated with education of clinicians on standard practice and application of safe injection techniques. (3) Consider whether technological solutions might be available or developed that would make unsafe injection practices more difficult or even impossible.

Conclusion

It will take a unified effort on the part of national healthcare organizations, governmental entities, and drug manufacturers to restore public trust and achieve the goal of ensuring and enhancing patient safety when it comes to the use of needles, syringes, and medication vials. Only by working together will healthcare providers be able to develop and implement universally accepted techniques and guidelines, and share in the responsibility of their use and enforcement without hesitation.

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