

One Less Problem

SAFE PRACTICES WHEN ADMINISTERING IV THERAPY

by Ron Stoker

Each year, we read about more and more patients that have come down with a healthcare-associated infection. These healthcare-associated infections, or HAIs, were formerly referred to as *nosocomial* infections. These infections are those that patients acquire while under the care of a healthcare institution. HAIs can result from inadvertent exposure to pathogenic bacteria, viruses, fungi or spores. These exposures can be caused by transmission from:

- ▶ contaminated healthcare workers' hands;
- ▶ environmental surfaces;
- ▶ patient-to-patient contact;
- ▶ catheter insertion; and
- ▶ maintenance practices.

The issue of HAIs is a personal one for this author. Three years ago, I was the “lucky” recipient of an HAI. It was an extremely nasty situation for me to deal with, but one that gave me—as a professional involved in infection control and healthcare safety issues—a lot to ponder. As a result of this preventable infection, I had to have antibiotic therapy every six hours for three months. My hospital bill alone exceeded \$60,000 for six days of hospitalization!

Just How Prevalent are HAIs?

Each year, healthcare-associated infections affect one in 20 hospital patients in the United States.¹ More than six million HAIs occur annually in the United States, Japan and Europe. These infections are increasing at a rate of 1.7 percent each year. HAIs even have the attention of the World Health Organization (WHO). WHO reports that HAIs affect “hundreds of millions of patients worldwide each year” and that more than 1.4 million people globally become seriously ill from such infections.² WHO estimates that almost 10 percent of patients admitted to hospitals in developed countries acquire HAIs. In some developing countries, this proportion can exceed 25 percent of all patients admitted to the hospital.

What are the Costs Associated with HAIs?

Between \$28 billion and \$30 billion are added to U.S. health costs each year from treating these infections. Bloodstream infections from these HAIs are reported to have an average cost of \$33,268.⁴ The *American Journal of*

Infection Control has reported that the average cost of a single HAI is greater than \$13,900. The Association for Professionals in Infection Control and Epidemiology (APIC) estimate that HAIs cost many billions of dollars in the United States alone. But the tolerance for this spending is waning. The U.S. government is tired of paying for the aftermath of these preventable infections. Starting October 1, 2008, Medicare will no longer provide the reimbursement to hospitals for a number of preventable conditions. It is believed that many managed care organizations will follow in the same direction. Hospitals that fail to correct the situation will end up eating the cost of treating these infections.

Because of these expenses and the potential for litigation, many healthcare institutions have determined that they are going to use any and all preventative measures to reduce the number of HAIs in their institutions. These preventative measures have started to show substantial impacts upon the profitability of the institutions, as the costs for treating HAIs are reduced or eliminated. Preventative programs do not need to be expensive or complicated to be effective. For example, hand hygiene programs are starting to be in vogue in many healthcare organizations. Healthcare workers are being asked to wear buttons that say “Ask me if I have washed” to encourage the public to participate in this large problem.

IV Therapy

What happens when poor hand hygiene habits and breaks in aseptic technique converge when administering IV therapy?

The impact of good hand hygiene on the spread of infections is well documented.⁵ Several unsafe medication-use practice habits place patients in danger of an infection. These include IV tubing being left uncapped and the ports on needle-free valves not being cleaned adequately.

The failure to place a sterile cap on the male end of a reusable IV administration set that has been removed from any primary administration set, saline lock or IV catheter hub leaves the male connector hanging between use. The tip of the IV administration set is then left exposed to ambient air and potential contaminants. This contamination can lead to an infection if the now non-sterile IV set is connected again to the patient's IV access. When the distal end of IV tubing is left uncapped

between intermittent infusions, this increases the likelihood that patients will acquire a healthcare-associated infection.

A second problem occurs when the port on an IV set's needle-free valve is not properly disinfected prior to accessing needle-free valves on the IV set. In this case, the port is exposed to potential contaminants that can be pushed into the patient's IV line once the port has been accessed by tubing or a syringe.

Unfortunately, both of these risks come from the implementation of needle-less IV systems. Prior to their introduction, clinicians typically replaced the needle used to connect the infusion to the IV tubing with a new sterile, capped needle to prevent contamination when the line was hanging between uses. It would appear that many clinicians do not consider the contamination risks of not maintaining a closed system when they do not place a sterile cap on the exposed tubing.



The common practice known as “looping” is when the distal end of the IV administration set is attached to an upper Y-site on the administration set, typically when a sterile cap is not available.

What are the current practices for capping administration sets?

The best practice for capping administration sets is to use a single-use sterile cap. Unfortunately, this is not always found in the nurse's pocket. If there is no cap handy as they work on an IV set at the patient's bedside, the nurse would have to leave the patient

to go find a sterile cap. So how do they handle the situation? Sometimes the administration set is just left open and therefore subject to airborne contamination. Sometimes, because of the length of the administration set, the tubing falls on the floor. Some clinicians have chosen to attach the exposed end of the IV tubing to an open port on the same set to maintain sterility. This practice, sometimes called looping, is not recommended by the Infusion Nurses Society (INS) and should not be done. This looping causes an unnecessary break in the line.

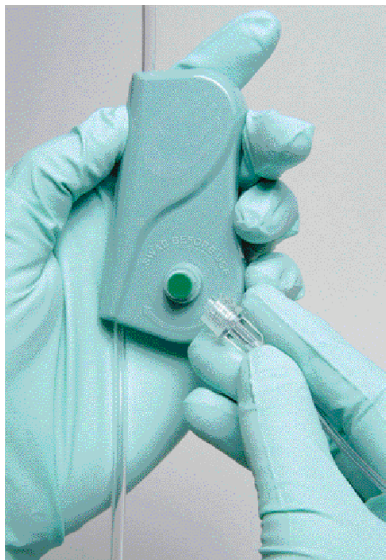
If the IV access port is not properly disinfected prior to attachment, then the male connector would contaminate the patient when reattached. The INS standards of practice indicate that “a compatible sterile covering should be aseptically attached after each intermittent use.”⁶ Unfortunately, this best practice is often not followed. Frequently, when an intermittent infusion has been completed, the IV tubing is disconnected and no sterile cap is attached. A new sterile cap must be used every time the tubing is capped. The disinfection procedure should include using alcohol swabs and allowing the alcohol to evaporate before accessing the port.

The safety issue here is a lack of compliance. Nurses are so overworked and continue to have larger patient loads under their care. Although infection control should take precedence, something has to give. Sometimes it's the line not getting capped.

So how often does this occur? My dear friend and nurse educator, Lynn Hadaway, conducted a survey of 361 nurses in December 2006.⁷ The participants of this survey came from 42 states in the United States as well as nine other countries, with the majority of respondents working in a hospital setting.

What is interesting in this study is that almost 90 percent of these clinical respondents acknowledged they had observed IV sets used to administer intermittent medications left disconnected and uncapped. Almost 41 percent of the respondents indicated they had observed administration sets left disconnected and uncapped at least several times per week, with 10 percent indicating they observe this at least once each shift.

How Often?	Percentage
At least once per shift	9.3%
Every other day	7.0%
Multiple times per shift	4.4%
About one or two times per week	22.2%
Rarely	46.7%
Other	10.4%



PadLock™ Set Saver from Baxa Corporation eliminates the need to search for sterile caps.

Frequency of intermittent sets found disconnected and uncapped⁷

Ms. Hadaway's survey also indicated the nurse respondents were asked, "Out of 100 sets used for intermittent IV infusion, what would be your estimated percentage of those left uncapped after disconnection?" The responses to the survey item ranged from "less than one percent" to "more than 90 percent." The survey respondents were nearly unanimous, however, in reporting that the action taken when an uncapped and disconnected set was discovered was to discard it and replace with a new set.

I would agree with this concept. In order to prevent HAIs, IV lines should be thrown away any time the procedure has been compromised. Some may choose to swab the end of the luer, but it is difficult to clean. Switching out administration sets before they need to be replaced can be a large expense to the hospital, but an HAI can be even more expensive and even deadly. And, with hospitals not getting reimbursed for HAIs, they need to do everything they can to reduce these infections.

One product that I believe will reduce the number of infections is the recently introduced PadLock™ Set Saver from Baxa Corporation. The PadLock Set Saver is a reusable device that provides a secure seal for the tip of an IV administration set, preventing line contamination when the set is not being used for infusion. I found it very easy to use.

After opening the sterile packaging, the PadLock is removed and clamped onto an IV administration set. The product has a one-way clamping mechanism, preventing it from removal after it has been used. After clamping it onto

the IV set tubing, I was easily able to slide it up and down the tubing as needed to position it appropriately. The PadLock is designed to be swabbed and reused, replacing the need for multiple, sterile single-use caps and facilitates best practice for aseptic closure of IV administration sets. The Set Saver attaches to the IV administration set, so it is always available at the bedside for safe, quick, convenient storage of the IV administration set between infusions.

So how is this product used?

Simply swab the septum, then connect the line to the septum for sterile storage. This is extremely convenient for nurses as it remains available at the bedside. Because it is connected to the line, the clinician does not have to hunt for a sterile cap. The PadLock Set Saver can be used for the life of the administration set, up to 96 hours. With the administration sets typically costing between \$10 and \$12 to replace, the PadLock can significantly improve the bottom line of a hospital in regard to replacement of contaminated lines.

Many clinicians are getting familiar with this product and are really excited about its ease of use. This product will continue to grow in popularity because it takes away one more thing that nurses have to remember—to go get a sterile cap. It's always available to them to close off the IV line.

For more information on this product, contact Baxa Corporation at www.baxa.com/padlock. †

References

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