January 27 is the 20th anniversary of the founding of the Institute for Safe Medication Practices (ISMP) as a nonprofit safety organization. We have learned a great deal during those 20 years, and it’s thanks to you and your willingness to report medication errors and hazardous conditions. Our anniversary made us think long and hard about ways we can improve upon our safety mission. One topic that reoccurs in discussions at ISMP is how saddened we are when, repeatedly, we must publish articles about well known, yet easily preventable, medication errors that result in serious patient injuries or death.

For example, during 2013, ISMP newsletters described cases of IV vincristine given intrathecally, overdoses of liquid medicines due to dose measurement errors, burns from the application of glacial acetic acid, dosing errors resulting from pound-kilogram confusion, and intravenous injections of oral liquids. Sadly, these are all too familiar in healthcare. It’s time to put a stop to these repetitive yet preventable errors!

In response, ISMP has launched the 2014-15 Targeted Medication Safety Best Practices for Hospitals in order to identify, inspire, and mobilize widespread adoption of consensus-based best practices on specific error-related issues that continue to harm patients or cause death. The targeted best practices are realistic strategies upon which hospitals can focus their medication safety efforts over the next 2 years. The best practices have been reviewed by an external expert advisory committee and each is accompanied by a rationale. Related issues of ISMP’s acute care newsletters are referenced to offer additional background.

The 2014-15 Targeted Medication Safety Best Practices for Hospitals target these primary areas of risk:

Pump resumes PCA dosing when turned off then on again

A teen pediatric patient was started on morphine patient-controlled analgesia (PCA) using a CADD-Solis Ambulatory Infusion Pump (Figure 1 on page 2). Later, the treating physician ordered the PCA to be stopped and oral oxycodonelow to be started as needed for pain. The patient’s nurse stopped the infusion and turned the pump off. However, the pump and medication cassette were not disconnected from the patient in case it needed to be restarted.

Approximately 4 hours after the pump was turned off, the patient’s mother, who knew that the pump was supposed to be off, approached a nurse and reported the PCA pump was running and the patient was still receiving doses. The nurse checked the PCA pump and discovered that it had been restarted at the previous settings. The patient admitted to turning the pump back on and administering 2 mg bolus doses every 15 minutes.

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The 2014-15 Targeted Medication Safety Best Practices for Hospitals target these primary areas of risk:
PCA continued from page 1

The pump event log was reviewed, and the scenario was recreated with a test pump. The CADD-Solis Ambulatory Infusion Pump does not auto-lock after a power down; thus, users can restart the pump without a security code. According to the reporting institution, this is a major concern, especially because it puts the patient at risk for untoward adverse effects from an opioid overdose, and puts the institution at risk of drug diversion. This event was reported to Smiths Medical, manufacturer of the CADD-Solis Ambulatory Infusion Pump. The company reported that the pump was functioning as designed. Auto-locking after every power down was not built into the original software design because, during field testing, users felt this led to an undesirable delay in resuming an ambulatory infusion after a battery change.

Several temporary solutions were proposed by members of the hospital’s Medication Error Reduction Committee. These included disconnecting the patient from the pump and/or removing the medication cassette at the time the pump is discontinued and turned off. However, for this hospital, the solutions were not always practical. Occasionally, pediatric patients will resume their PCA if they do not tolerate oral dosing. Disconnecting the patient from their device, only to resume the therapy several hours later, may lead to an increased risk of a line infection. In this situation, another option would be to reset the PCA dose and continuous infusion rate to “zero” prior to shutting off the pump, so that if the pump is turned back on, a security code must be entered to modify the pump settings.

Smiths Medical has suggested a third option: remove the battery pack from the PCA device when it is not in use, as the pump will not function without the battery. The reporting hospital expressed concern that batteries could be lost or misplaced, leading to delays in starting infusions and increased cost to the institution to purchase replacement batteries. Another option might be to purchase lock boxes for the pump so it cannot be manipulated without action by staff.

The hospital has approached Smiths Medical to request a permanent solution, such as redesign of the software to allow inpatient facilities an option to activate an auto-lock mode after power down. A Smiths Medical representative informed ISMP that they are exploring this further. We checked with other PCA vendors, and those we spoke with require a series of steps and code entry when the pump is restarted after being turned off. However, we were unable to conduct a review of all infusion pumps on the market.

The hospital that reported this event had approached other organizations to use the CADD-Solis Ambulatory Pump to be aware of the risks associated with its use. A patient may receive IV or oral opioids in addition to an unintended opioid from a discontinued PCA pump. Healthcare professionals are unlikely to be aware that the PCA is still being used if a patient or family member turns the pump back on. This may lead to an opioid overdose, excessive sedation, respiratory depression, or death. We are in agreement that the software needs to be redesigned to require reentry of a security code to restart the pump. Please check your PCA pumps to see if this safeguard is included.

**Potential dose confusion.** Communicating the proper dose of Spiriva (tiotropium) can be difficult with many computer order entry systems. Spiriva is an oral inhalation product indicated for the long-term maintenance treatment of bronchospasms associated with chronic obstructive pulmonary disease (COPD). The product comes with a HandiHaler device intended to deliver the full contents of the drug, which is contained in a capsule for inhalation. The recommended dose of Spiriva, using the HandiHaler, is 2 inhalations of the powder contents of 1 capsule. Many computer order entry systems will default to a dose of 1 inhalation. If you change the default value to 2 inhalations, confusion can lead to the patient receiving the contents of 2 capsules. If you enter 1 capsule, the patient will receive the product orally. Express the dose in a way that makes it clear (e.g., 1 capsule = 2 inhalations) in your discharge summary.
Question and Answer: What size syringe is needed?

Are 10 mL (or 10 mL diameter - shorter syringe with larger barrel) syringes needed when giving medications via venous access devices?

There seems to be some confusion about the syringe size needed for IV drug administration via a venous access device (VAD) such as an implanted port or a peripherally inserted central catheter (PICC). Most practitioners know that smaller diameter syringes create greater amounts of pressure than larger diameter syringes. The Infusion Nurses Society (INS) has identified that the pressure generated by a flush, if too high, can damage the catheter. INS standard #45 states, “To prevent catheter damage, the size of the syringe used for flushing and locking should be in accordance with the catheter manufacturer’s directions for use. Patency is assessed with a minimum 10 mL syringe filled with preservative-free 0.9% sodium chloride. Flush syringes holding a smaller volume and/or designed to generate lower amounts of pressure may also be used to assess patency.” (Infusion Nursing Standards of Practice, Standard 45. Flushing and Locking; Practice Criteria H.)

Unfortunately, in their product labeling, some IV catheter manufacturers have extended this to include IV medication injections as well. That, in turn, has understandably led hospitals to restrict IV injections of medication to syringes of 10 mL (or 10 mL diameter) or more. This has often led to nurses emptying the contents of prefilled medication syringes less than 10 mL into a 10 mL syringe prior to injection, defeating the purpose and safety of unit dose syringes, such as Carpuject or pharmacy-prepared and labeled syringes. There are multiple dangers with this practice, particularly because it does not allow the ability to perform bedside medication barcode scanning. It can also lead to partial loss of the dose during transfer, compromise accurate measurement of small doses intended for pediatric patients, and increase the chance of accidental contamination. The practice may also result in unlabeled syringe contents.

What has been missed is that the INS standard cited above also states, “Administration of small quantities of medication should be given in a syringe appropriately sized for the dose required following confirmation of catheter lumen patency.” We confirmed with INS that, in most cases, repackaging of a medication into a 10 mL syringe at the bedside is not necessary once line patency has been confirmed via flushing using a 10 mL syringe. According to the representative from Bard Access Systems, with the exception of a 1 mL prefilled syringe, a strategy now being sanctioned for the company’s catheters and ports is to initially assess catheter patency with a saline flush using a 10 mL diameter syringe. Once patency is assured, medication administration in a smaller diameter syringe is acceptable. The representative told us the company is changing product labeling to reflect this newer strategy arising from its research and development department.

Best Practices—continued from page 1

- IV vinCRIStine erroneously given intrathecally
- Oral methotrexate given daily instead of weekly
- Potential confusion between pounds and kilograms
- Oral solutions given IV
- Oral liquid dosing devices with confusing gradations
- The presence of glacial acetic acid in the hospital

We strongly encourage adoption of the best practices that will help prevent these types of errors. The best practices are fully described at: www.ismp.org/tools/bestpractices. So we can monitor the effectiveness of this effort, we are conducting a short survey to get a sense of the current level of implementation of these best practices as a baseline. You can review the survey questions on page 4 and take the survey at: www.surveymonkey.com/s/ISMPTargets.

In addition, there will be a FREE webinar on January 30, 2014, to discuss the best practices in more detail. For information and to register, please visit: www.proce.com/bestpractices.

ISMP is conducting a short survey to get a general sense of the current level of implementation of the **2014-2015 Targeted Medication Safety Best Practices for Hospitals** as a baseline measure. We would appreciate your participation regardless of whether you have or have not implemented any or all of the practices. Please complete this survey by February 28, 2014: www.surveymonkey.com/s/ISMPTargets. The survey questions are in the tables below for your review prior to taking the online survey. For a detailed description and exact wording of the best practices, visit: www.ismp.org/Tools/BestPractices/TMSBP-for-Hospitals.pdf.

Please select the best option that reflects the status of the best practices in your hospital using the **KEY** that follows. **Do not guess** at the answers; choose **Don’t Know** if you are uncertain. For B, C, D, or E answers, provide the additional information requested in the **Comments** section.

**KEY:**
- A. There has been **no activity** to implement this best practice.
- B. This best practice has been formally considered, but we have **decided not to implement it**.
- C. This best practice is **planned but has not been implemented yet**.
- D. This best practice has been **partially implemented in some or all areas** of the organization.
- E. This best practice is **fully implemented in some areas** of the organization.
- F. This best practice is **fully implemented throughout the organization**.

<table>
<thead>
<tr>
<th>Best Practices</th>
<th>(See Key Above)</th>
<th>Comments *Additional Information Requested</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dispense vinCRISTine (and other vinca alkaloids) in a minbag of compatible solution, and not in a syringe.</td>
<td>A B C D E F Don’t Know</td>
<td>B: Why did you decide not to implement the practice? C: When will implementation start? D: What aspects are not yet implemented and why? E: In which areas is the practice implemented?</td>
</tr>
<tr>
<td>2a Use a weekly dosage regimen default for oral methotrexate. If overridden to daily, require a hard stop verification of an appropriate oncologic indication. For manual systems, require verification of an oncologic indication before dispensing daily oral methotrexate.</td>
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<tr>
<td>2b Provide patient education by a pharmacist for all weekly oral methotrexate discharge orders. Explain to the patient that taking extra doses is dangerous and that the drug should not be used as needed for symptom control. Provide patients with a drug information leaflet that contains clear instructions about weekly dosing, such as the free ISMP consumer leaflet.</td>
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<tr>
<td>3 Measure and express patient weights in metric units only. Scales used for weighing patients are set and measure only in metric units (i.e., grams [g] and kilograms [kg]). If scales can measure in pounds and g/kg, modify the scale to lock out the ability to weigh in pounds. Computer systems and medication device (e.g., pumps) screens, printouts, and preprinted order forms should list or prompt for weights only in g (neonates) or kg. Document weights using metric designations only. Use measured weight, not a stated, historical, or estimated weight.</td>
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<tr>
<td>4 Ensure that all oral liquids that are not commercially available as unit dose products are dispensed by the pharmacy in an oral syringe. Use only oral syringes marked “Oral Use Only.” Use of an auxiliary label “For oral use only” on syringes is preferred, if it does not obstruct critical information. Ensure that oral syringes do not connect to parenteral tubing in the hospital.</td>
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<tr>
<td>5 Purchase and use oral liquid dosing devices (oral syringes/cups/droppers) that only display the metric scale. Patients discharged on an oral liquid medication should be provided with oral syringes (or a prescription for oral syringes) to measure volumes in mL.</td>
<td></td>
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<tr>
<td>6Eliminate glacial acetic acid from all areas of the hospital:* This includes all clinical areas of the hospital (e.g., pharmacy, clinics, physician offices, patient care areas). Replace glacial acetic acid with vinegar (5% solution) or commercially available, diluted acetic acid 0.25% (for irrigation) or 2% (for otic use). *Laboratory use excluded if lab purchases directly from an external source.</td>
<td></td>
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</tbody>
</table>

**Please select one answer in each category that best describes your hospital, the number of inpatient beds, and your professional designation.**

**Hospital:**
- Non-academic/non-governmental/not-for-profit
- Investor-owned/for-profit
- Academic
- Government (state/local)
- Military
- Veterans Affairs
- Critical access
- Other:

**Hospital Inpatient beds:**
- 25 beds or less
- 26-99 beds
- 100-299 beds
- 300-499 beds
- 500 beds and over

**Profession:**
- Nurse
- Pharmacist
- Physician
- Administrator
- Other:

Prior to receiving this survey, were you aware of ISMP’s **2014-2015 Targeted Medication Safety Best Practices for Hospitals**?

- No
- Yes If yes, how did you hear about the best practices?__________
Three Unique Fellowship Programs

The Institute for Safe Medication Practices (ISMP) is now accepting applications for

Three 2014-2015 Fellowships

ISMP Safe Medication Management Fellowships (Two Positions)

FDA/ISMP Safe Medication Management Fellowship

One Position Supported by Express Scripts

**Location and Term:** The 12-month Fellowship commences summer 2014 at the Pennsylvania (near Philadelphia) office of ISMP. Relocation to the Philadelphia area is required.

**Description:** The Fellowship offers a nurse, pharmacist, or physician with at least 1 year of postgraduate clinical experience an unparalleled opportunity to learn from and work with some of the nation’s experts in medication safety. Now in its 22nd year, the Fellowship allows the candidate to work collaboratively with practitioners in various healthcare settings to assess and develop interdisciplinary medication error-prevention strategies.

**FDA/ISMP Safe Medication Management Fellowship**

**Location and Term:** The 12-month Fellowship commences summer 2014. The Fellow will spend 6 months at the Pennsylvania (near Philadelphia) office of ISMP and 6 months at the Maryland (near Washington, DC) office of the US Food and Drug Administration (FDA). Relocation to the Philadelphia and Washington, DC, area is required.

**Description:** The Fellowship, open to a healthcare professional with at least 1 year of postgraduate clinical experience, is a joint effort between ISMP and FDA’s Center for Drug Evaluation and Research, Office of Surveillance and Epidemiology, and Division of Medication Error Prevention and Analysis. The Fellowship allows the candidate to benefit from ISMP’s years of experience devoted to medication error prevention. At FDA, valuable regulatory experience is gained by working with the division focused on medication error prevention.

A competitive stipend, 2 weeks paid vacation, and full health benefits are provided with all Fellowship Programs.

**How to Apply**

Information and applications can be found at: [www.ismp.org/profdevelopment/](http://www.ismp.org/profdevelopment/). Applications can also be requested by calling 215-947-7797.

**Speak to ISMP’s Current Fellows**

Please join us on February 5, 2014, at 2:00 p.m. ET for a special, live conference call about the Fellowship programs. Current and past Fellows will describe their Fellowship experiences as well as plans for their post-Fellowship careers. They will also be available to answer any questions you may have about the Fellowship. To attend, please send an email to fellowship@ismp.org.

The application deadline for all Fellowship Programs is March 31, 2014.