In the January 16, 2014, newsletter issue, we introduced the 2014-2015 Targeted Medication Safety Best Practices for Hospitals. The purpose of the Targeted Medication Safety Best Practices is to identify, inspire, and mobilize national adoption of consensus-based best practices related to medication safety issues that continue to cause harmful and fatal errors, despite repeated warnings from ISMP and others. To monitor the effectiveness of this effort over the next 2 years, we conducted a short survey of US hospitals during the first quarter of 2014 to get a sense of the current level of implementation of these best practices as a baseline measure.

Table 1 (page 2) summarizes the survey findings from 483 respondents. Additional details are provided below.

**Respondent profile.** About half (52%) of all respondents work in non-academic, non-government, non-profit hospitals. Nine percent work in for-profit hospitals, 9% work in government-owned hospitals, 20% work in academic hospitals, and 10% work in critical access hospitals. About two-thirds (69%) of the respondents were nurses. The remaining respondents (28%) were pharmacists, and about a quarter (28%) were physicians or hospital administrators. Survey responses from respondents who did not know the level of implementation of the best practice, or thought a best practice was not applicable, were not included in the analysis.

About half (53%) of participating respondents reported full implementation of this best practice. Those who reported partial implementation (10%, calculated by combining responses D and E in Table 1) noted more frequent adoption of the practice with vincristine (and other vinca alkaloids) in a minibag of compatible solution and not in a syringe.

Respondents from hospitals where a decision was made to NOT implement the best practice (8%) cited a variety of reasons, including that the practice was not feasible (12%) or that the practice was too time-consuming (9%).

**Report improper screen display of therapeutic alternatives**

In a Safety Brief in our March 13, 2014 newsletter, we reported an issue involving potentially improper formulary alternatives displayed on ambulatory electronic medication ordering screens. Based on additional reports, we now believe the situation is more widespread than we first thought.

In the earlier Safety Brief (www.ismp.org/sc?id=314), we included a screen shot in which acetaminophen was prescribed and cloNDine (an analgesic adjuvant drug) was recommended as an alternative. Some of the proposed alternatives seen during prescribing may be in the same broad therapeutic class (e.g., central nervous system drug). In a recent report, AMBIEN (zolpidem), a hypnotic, was prescribed, and the alternatives listed were haloperidol and fluPHENAZine, which are tranquilizers. In other situations, the proposed alternative seems to bear no relationship whatsoever to the prescribed drug. Case in point: hydrocortisone/acetate oint (VOSOL HC) was listed as an alternative to U-500 insulin.

Another issue is that the strengths of the prescribed drug and suggested alternatives may vary greatly. For example, choosing aspirin enteric coated 81 mg brings up
Diastat AcuDial requires setting and locking of the dose. The DIASTAT ACUDIAL (diazepam rectal gel) delivery system is available for rectal administration to manage selected refractory epilepsy patients who are on stable regimens of anti-epileptic drugs and also require intermittent use of diazepam to control bouts of increased seizure activity (cluster seizures). The product is available in 10 mg or 20 mg rectal syringes designed to deliver minimum dosages of 5 mg or 12.5 mg, respectively, with dosage increments of 2.5 mg up to a maximum of either 10 mg or 20 mg. (There is also a 2.5 mg syringe available for pediatrics.) There are two unlocked rectal syringes per package. Since the introduction of the device, a number of errors have occurred because the device was not properly dialed and locked prior to administration. This led to administering too much medication. Some of these errors have resulted in respiratory depression requiring emergency intervention. Before the product is dispensed, syringes must be dialed, set, and locked to the prescribed dose by the pharmacist, even when the maximum dose is prescribed. Once set and locked, the prescribed dose will appear in the dose display window, and the locking ring, designated with a green “ready” band, will be engaged. This helps to prevent the wrong dose or an overdose from being administered by the caregiver. We mentioned this Diastat issue in our September 7, 2006, newsletter but were reminded of it last week after receiving an error report from a consumer who gave her adult daughter 20 mg instead of 15 mg. Although it's not exactly clear if the syringe had been locked or not, we thought we'd reinforce the need for pharmacists to lock the syringes and educate patients and caregivers about the proper use of the practice’s safety in regards to extravasation (www.ismp.org/sc?id=315). Information is also available regarding safety via peripheral administration.

Best Practice: Use a weekly dosage regimen default for oral methotrexate. If overridden to daily, require a hard stop verification of an appropriate oncologic indication.

About a quarter (28%) of respondents reported full implementation of this best practice. Most respondents who reported partial implementation (19%) indicated that order entry systems defaulted to a weekly dosage regimen but did not require a hard stop if the regimen was changed to a daily schedule. For hospitals in the planning stages (13%), many respondents anticipated implementation in March 2014. A few respondents reported that implementation would be delayed because their hospitals were involved in large-scale technology upgrades that needed to be implemented first.

The primary reasons cited by respondents in the few hospitals (2%) deciding NOT to implement the practice included the inability to set up a hard stop in current order entry systems or a belief that the best practice is not practical or necessary if treating mostly cancer patients.

Table 1. Percent of Implementation of Targeted Best Practices—Baseline Measurement (N=483)

<table>
<thead>
<tr>
<th>Best Practices (see full description of each practice in article)</th>
<th>Percent (%) Implementation*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>1. Dispense vinCRIStine (and other vinca alkaloids) in minibag</td>
<td>22</td>
</tr>
<tr>
<td>2a. Use a weekly dosage regimen default for oral methotrexate; if overridden to daily, require hard stop verification of cancer indication</td>
<td>38</td>
</tr>
<tr>
<td>2b. Pharmacists provide education to patients discharged on weekly oral methotrexate; provide patients with information leaflet</td>
<td>62</td>
</tr>
<tr>
<td>3. Measure and express patient weights in metric units only; scales set and measure only in metric units and lock out the ability to measure in pounds; only measured weights are used</td>
<td>18</td>
</tr>
<tr>
<td>4. Dispense oral liquids not commercially available as unit dose products in oral syringes that do not connect to parenteral tubing; use auxiliary labels that state “For Oral Use Only”</td>
<td>7</td>
</tr>
<tr>
<td>5. Use oral liquid dosing devices that display only the metric scale; provide patients discharged on oral liquid medication with oral syringes</td>
<td>31</td>
</tr>
<tr>
<td>6. Eliminate glucal acetic acid from the hospital and replace with vinegar (5%) or commercially available diluted products (0.25%, 2%)</td>
<td>13</td>
</tr>
</tbody>
</table>

A: No activity  B: Considered but decided not to implement  C: Planned but not implemented yet  D: Partial implementation in some or all areas  E: Full implementation in some areas  F: Full implementation

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SafetyBriefs continued from page 2

the device, including confirming that: the prescribed dose is visible in the display window; the green ready band is visible; and the smaller rectal tip size is used if the patient is a child. A 2007 US Food and Drug Administration (FDA) Patient Safety News video (produced in cooperation with ISMP) on proper use of Diastat is available at: www.ismp.org/sc?id=321.

IV saline substitutes. Institutions using alternative IV fluids during the current 0.9% sodium chloride injection shortage need to consider compatibility of the alternative IV fluids used with medications or blood/blood products the patient is receiving IV (IV infusion and IV push). As an example, Lactated Ringer’s solution is one alternative that patients are receiving. Due to its calcium content, the solution is not suitable for co-administration with blood. According to the Lactated Ringer’s package insert: “Solutions containing calcium ions should not be administered simultaneously through the same administration set as blood because of the likelihood of coagulation.” Please make sure staff (pharmacists, nurses, and blood bank staff) are aware of the shortage and to check compatibility of alternative solutions when co-administering drugs or blood products.

Safety is personal. A new report from the Lucian Leape Institute at the National Patient Safety Foundation, Safety Is Personal: Partnering with Patients and Families for the Safest Care, is available for viewing or download at: www.ismp.org/sc?id=324. A webinar hosted by the Lucian Leape Institute will discuss the paper and its recommendations. The webinar is free and open to all on April 29, 2014, at 11 a.m. (ET). For more information, please visit: http://bit.ly/LLI_0314.

Oral vaccines. In our March 13, 2014 article, “Recommendations for practitioners and manufacturers to address system-based causes of vaccine errors” (www.ismp.org/sc?id=322), we mentioned that the only oral vaccine available in the US is the rotavirus vaccine. While it may be true among commonly administered vaccines, it escaped us that there is also an oral vaccine for prevention of typhoid fever known as VIVOTIF. We thank Christina Benner, PharmD, regional pharmacy manager in Safeway Pharmacy’s eastern region, who brought this to our attention. Typhoid vaccine contains the attenuated strain Salmonella

Bull’s eye continued from page 2

ISMP comments. Be persistent with vendors when requesting the ability to build a hard stop related to daily methotrexate dosing. Also, while the focus of this best practice is to reduce errors when methotrexate is prescribed for non-oncologic conditions, the same medication safety practices should apply to all patient care settings, including cancer centers. Even when used for oncologic purposes, methotrexate is sometimes prescribed as a weekly regimen, not daily.

Best Practice Provide patient education by a pharmacist for all weekly oral methotrexate discharge orders. Provide patients with a drug information leaflet that contains clear instructions about weekly dosing, such as the free ISMP consumer leaflet.

Only 11% of respondents reported full implementation of this best practice, and just 11% reported partial implementation. Respondents reporting partial implementation noted that education was provided to patients in some areas of the hospital where a clinical pharmacist was readily available. However, many respondents commented that written information was not provided to patients during the educational sessions, or that the information provided was not clearly defined or organized. A few respondents also reported that educational efforts were inconsistent in their hospitals. Those actively planning to implement the best practice (13%) mostly anticipated completion by the fall of 2014.

A decision to NOT implement this best practice was made by 3% of respondents who reported inadequate resources, particularly pharmacy staff. Several respondents mentioned that nurses educate patients prior to discharge, or that the patient population does not support the need for education by a pharmacist.

ISMP comments. In many hospitals, the frequency of patients discharged on weekly methotrexate should be manageable for typical pharmacy staffing to facilitate education by a pharmacist on this crucial topic. Free consumer leaflets to standardize and support the education can be found at: www.ismp.org/sc?id=316.

Best Practice Measure and express patient weights in metric units only. Ensure that scales used for weighing patients are set and measure only in metric units (kg, g). If scales can measure in pounds and kilograms/grams (kg/g), modify the scale to lock out the ability to weigh in pounds. Document weights using metric designations only. Use measured weight, not stated, historical, or estimated weight.

One-third (33%) of survey participants reported full implementation of this best practice. Respondents who reported partial implementation (36%) most often cited these barriers: 1) the inability to completely lock out or eliminate the measurement and documentation of weights in pounds with scales that measure in both kg/g and pounds, or with electronic prompts that allow entry of either measure; and 2) over-reliance on stated, estimated, or historical weights. Several respondents also mentioned difficulties with specialty beds that only weigh in pounds. Hospitals currently planning to implement the strategy (6%) suggested a timeline consistent with the arrival of new scales or updated technology, particularly in the fourth quarter of 2014.

Respondents who work in hospitals where a decision was made to NOT implement this best practice (7%) cited as reasons the inability to lock out weights measured or displayed in pounds on scales and computer systems, and a belief that patients and parents of pediatric patients want to know their (or their child’s) weight in pounds, not kg or g. Numerous others cited lack of support for the best practices from nurses as well as hospital leadership, who believe clinicians and patients still think in terms of pounds, not metric units.

ISMP comments: Pound to kg/g conversion charts should be available for nurses and other healthcare personnel to use when discussing measured weights with the patient and family. Having patients ask for their weight in pounds should not be a barrier to collecting and documenting the information in metric units. More on this topic and suggestions for managing other barriers to the best practice can be found at: www.ismp.org/sc?id=317.

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Safety Briefs continued from page 3

Typhoid vaccine (Ty21a) is marketed by Bierna Biotech Ltd in gelatin capsules that are enteric coated to render the capsule resistant to dissolution by acid in the stomach. More information can be found at: www.ismp.org/sc?id=323. Oral polio vaccine (OPV; Sabin), a live attenuated virus vaccine, was removed from the US market in 2000. Although it was extremely effective in eradicating polio in the US, there was a rare (1.750,000) unfortunate issue with permanent paralysis. Today, only inactivated polio vaccine (IPV) is available here (OPV is still used in some other countries).

Trace elements shortage survey. The shortage of US commercially available parenteral nutrition trace element products has been ongoing since 2010. With the prolonged shortages, the American Society of Parenteral and Enteral Nutrition (A.S.P.E.N.) is interested in assessing how clinicians are managing current shortages. Please take a few minutes to complete the survey and share your current clinical experiences and shortage management practices. The estimated time to complete this voluntary survey is 15 minutes. This survey should be completed by healthcare professionals who are knowledgeable of the trace element products used to prepare parenteral nutrition admixtures in their organization. If you are unable to complete the survey, please forward this survey request to a pharmacist or other personnel in your organization who have this knowledge. Access the survey at: www.surveymonkey.com/s/7326L7.

Confusing concentration. A hospital pharmacy technician let us know that the top box flap on cartons holding Rugby’s Nasal Decongestant Liquid is a bit misleading (Figure 1). The main ingredient, pseudoephedrine, is listed as “Pseudoephedrine HCl 30 mg” followed by “4 fl oz (118 mL).” The amount per mL or per 5 mL is not listed, which could lead an inexperienced individual to believe that 30 mg is in 4 ounces. We contacted Rugby and asked them to revise the carton label to indicate that the actual strength is 30 mg per 5 mL. The concentration is listed in the Drug Facts panel on the product carton.

Bull’s eye continued from page 3

Best Practice Ensure that all oral liquids that are not commercially available as unit dose products are dispensed by the pharmacy in an oral syringe. Use of an auxiliary label, “For oral use only,” is preferred if it does not obstruct critical information. Ensure that oral syringes do not connect to parenteral tubing in the hospital.

About half (52%) of survey participants reported full implementation of this best practice. Respondents who reported partial implementation (34%) still dispense bulk bottles or dosing cups for medications such as antibiotics, antacids, and certain controlled substances (e.g., methadone). Some respondents reported the use of bulk bottles or dosing cups for some medications for adults, although all oral liquid medication doses for pediatric patients were dispensed in oral syringes. A few participants felt that the oral syringes were not clearly labeled to alert staff that the drug is “For oral use only.” Several respondents also reported a few exceptions to the best practice; for example, one hospital dispenses acetaminophen in its original bottle, which is sent home with the patient upon discharge. Another respondent reported keeping a few oral liquid medicines in their original packaging, as recommended by the manufacturer. Respondents actively planning implementation of the practice (4%) anticipated completion within 6 months.

Respondents who reported their hospitals will NOT be implementing the best practices (3%) cited storage issues and potential waste of pharmacy batched prefilled syringes, infrequent use of oral liquid medications, and disruption in pharmacy workflow or staffing shortages associated with pharmacy preparation of the syringes. One respondent reported that dose cups are used for all liquid medications after at least one error in which nurses, who were not familiar with seeing or using oral syringes, mistakenly thought an oral syringe contained a parenteral product and transferred the drug to a parenteral syringe for administration.

ISMSP comments. Education regarding the purpose and use of oral syringes should be provided during orientation of all professional staff who administer medications. Dispensing patient-specific doses in a unit dose cup is an acceptable practice. However, the risk with this practice is that nurses may draw the oral solution into a parenteral syringe for administration, which could lead to inadvertent misadministration and patient harm. Thus, the best practice is to dispense patient-specific doses in an oral syringe. For more information on this topic, visit: www.ismp.org/sc?id=318.

Best Practice Purchase and use oral liquid dosing devices (oral syringes/cups/droppers) that only display the metric scale.

Approximately 39% of survey participants reported full implementation of this best practice. Respondents reporting partial implementation (17%) of the best practice noted that hospitals are exhausting the current supply of dosing devices before distributing the new devices. Those actively planning implementation of the best practices (9%) cited a timeline that began as soon as dosing devices with only metric units were available and purchased.

Respondents who reported their hospitals will NOT be implementing these best practices (4%) provided several reasons: the current purchasing vendor under contract has been unable to find dosing devices with only metric measurements, and staff believe it is important to teach parents to measure doses using an oral syringe with both metric and non-metric designations, stating that parents understand teaspoon and tablespoon measurements better than metric designations.

ISMSP comments. Please see our Frequently Asked Questions (www.ismp.org/sc?id=319) for examples of vendors with dosing cups and oral syringes that display metric units only.

Best Practice Eliminate gluceralic acid from all areas of the hospital (laboratory excluded if the gluceralic acid is purchased directly from an external source). Replace gluceralic acid with vinegar (5% solution) or commercially available acetic acid 0.25% (for irrigation) or 2% (for otic use).

continued on page 5 — Bull’s eye
**Special Announcements...**

**ISM P webinars**
Join us on March 27 for our webinar, Addressing Safety Challenges with U-500 Insulin (And did you know U-200 and U-300 insulin products are now on the way?). ISM P has received a growing number of reports related to serious S-fold dosing errors with U-500. Learn more about common errors with U-500 insulin and how to prevent them. Also, share in the discussion of two new insulin concentrations in clinical trials, and assess their benefits and risks compared to U-100 and U-500 insulin.

Join ISM P for our April 23 webinar, Basal Bolus Insulin Therapy: Implementing Best Practices for Inpatients with Hyperglycemia. According to 2014 American Diabetes Association guidelines, non-critically ill, hospitalized diabetic patients should be managed with scheduled subcutaneous insulin doses that include basal, nutritional, and correctional components to maintain glucose control. Learn how to successfully transition an organization from a sliding scale insulin approach to this best practice. Learn the challenges faced during transition, the use of metrics to show improved outcomes, and the components of a competency-based educational program.

For details on both webinars, please visit: www.ismp.org/educational/webinars.asp.

**Unique 2-day program**
Attend ISM P’s Medication Safety INTENSIVE workshop in Washington, DC, on April 10-11, 2014. This workshop provides hands-on experiences with risk assessment, event investigation, error analysis, selecting error-reduction strategies, action planning, measuring effectiveness, Just Culture, and more! For details, visit: www.ismp.org/educational/MSI.

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**Bull’s eye continued from page 4**
Almost three-quarters (74%) of survey participants have fully implemented this best practice, and another 8% reported partial implementation. Respondents who reported partial implementation felt glacial acetic acid was needed in the pharmacy to compound certain products (e.g., 6% dermatological solution). For hospitals in the planning stages (5%), most respondents anticipated implementation by March 2014. Only 1 survey participant reported that his or her hospital will NOT be implementing this best practice.

**ISM P comments.** If glacial acetic acid must be used in the laboratory or for research in non-patient care areas, see our Frequently Asked Questions (www.ismp.org/sc?id=320) for recommendations to promote safety.

**Conclusion.** We truly appreciate everyone’s participation in this baseline survey. Overall, ISM P was pleased to learn that, for many, the Targeted Best Practices have been accomplished or are on their to-do list. However, it was disappointing to learn the extent to which other respondents had not at least partially implemented important practices recommended by ISM P and other safety organizations for years. We are also disappointed to see that some organizations do not intend to pursue the best practices, we presume largely because they fail to perceive the immense risk they are taking without implementing the strategies. The 2014-2015 Targeted Medication Safety Best Practices were selected by a well-informed, expert advisory group that, like ISM P, felt these practices were critical to patient safety, highly effective, and achievable without significant capital expenditures. We strongly encourage ALL US hospitals to adopt these practices.

If you have questions or want to share an implementation strategy, policy, or guideline that we can recommend to others, please contact ISM P at: ismpinfo@ismp.org.

**Alternatives continued from page 1**
salicylate 500 mg or 750 mg and choline magnesium trisalicylate 1,000 mg. In another case, when amoxicillin was ordered, several different penicillins appeared, but some were not appropriate for the specific infection being treated. A number of other examples have been received.

We have been in communication with Epic, an IT vendor, and Surescripts, the network portal that communicates information between pharmacy benefit managers (PBMs) and electronic health record systems. We have also learned that the incorrect information displayed may be received by the IT vendor from the drug information vendor. Although we’ve been informed that this issue is under review with movement toward resolution, this issue is not yet resolved. Therefore, those who oversee electronic prescribing systems must examine their systems and discuss the matter with prescribers who also need to be aware. Based on their own experiences, prescribers may be able to shed additional light on the problem.

To participate in the Surescripts e-Prescribing network, your system must provide alternatives when the selected medication is not covered by the patient’s PBM. However, based on the number of clinically inappropriate alternatives that have been reported, we do not believe the display of alternatives should be required functionality at this time.

If this problem is uncovered in your organization, we highly encourage you to contact your IT vendor immediately to discuss your options for restricting or disabling the display of alternatives and ask them to log a case so that Surescripts and other stakeholders can get the necessary details to research the issue and take appropriate action. It would also be helpful if the vendor changed the misleading “alternative” terminology if that is displayed. We also ask that you notify ISMP of any issues you may be having with this feature or other issues that result in presentation of possible wrong information, even if you have reported those issues to your vendor. If you have any other suggested operational changes, please let us know by contacting us at ismpinfo@ismp.org. We will continue to investigate and monitor this issue and report our findings as appropriate.