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ISMP
An ECRI Affiliate

Acute Care
ISMP Medication Safety Alert!®
Educating the Healthcare Community About Safe Medication Practices

Personal practice changes practitioners would make after learning firsthand about medication errors at ISMP

Awareness about medication errors and their causes prompts change. One lesson we have clearly learned is that the most effective strategies to prevent medication errors often lie outside the direct control of individual practitioners, particularly strategies related to technology, the environment, and the design of systems and processes. But there are many things individual practitioners can do in their own practice—changes in their behavioral choices when carrying out the tasks associated with medication use—to reduce the risk of a medication error.

During their experience at ISMP, students and fellows have seen firsthand the devastation that medication errors have wrought, and they know that medication errors could happen to them, too. We repeatedly hear that the experience at ISMP has changed their practice. ISMP staff and other practitioners associated with ISMP echo similar sentiments. More than 20 years ago, we asked ISMP nurses to share their thoughts about the personal practice changes that they would make if they returned to practice at the bedside (www.ismp.org/node/31174). We did the same recently in January 2022, but this time we solicited answers to the following question from more than a dozen past and present ISMP fellows and staff: *After being at ISMP, if you returned (or have returned) to frontline patient care, what three things would you do (or have done) differently?* Described below are the top 10 changes practitioners would make (or have made) in their personal practice habits after learning firsthand about medication errors at ISMP. Three of the practice changes are the same as described by ISMP nurses more than 20 years ago: Make error reporting a priority, promote a Just Culture, and do not sacrifice safety for timeliness.

① **Make error reporting a priority.** It is only through insightful information from those who have made errors that we learn about their underlying causes and strategies for prevention. Thus, reporting hazards, close calls, and other errors was a frequently cited priority for practitioners associated with ISMP. Some practitioners were very specific in their survey response, indicating that they would report more hazards and close calls, describe errors more fully in narrative reports, make it easier for staff to report errors internally, and follow-up more closely with the reporter. Many said they would actively seek feedback about reported errors or hazardous situations to spark change, as well as support colleagues who have made errors. Of course, practitioners would make (or have made) a commitment to report notable errors or potentially hazardous conditions externally to the ***ISMP National Medication Errors Reporting Program*** or the ***ECRI and the ISMP Patient Safety Organization*** (www.ismp.org/MERP). Everyone associated with ISMP knows firsthand how valuable it is to share "lessons learned" with others.

② **Fully utilize ISMP resources.** Many practitioners associated with ISMP reported that they would utilize the ISMP newsletters as well as the quarterly ***Action Agenda*** more fully by bringing reports of errors that have occurred elsewhere to staff or safety meetings, discussing the likelihood of it happening at their practice site, identifying possible causes, and making suggestions for proactive prevention. Respondents also mentioned other specific ISMP resources, such as visiting the ISMP website (www.ismp.org) more frequently to search for tools, resources, alerts, and services; implementing the ISMP ***Targeted Medication Safety Best Practices for Hospitals***

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SAFETY briefs

Baxter ExactaMix automated compounding device valve set shortage. Baxter has notified its customers this week about a serious supply chain issue creating a shortage of the valve set that is required for the Baxter ExactaMix automated compounding device (ACD). The letter warning about the valve set shortage is available in Baxter's medical information portal by visiting: http://medinfo.baxter.com/. To access the letter at the provided link, you must register first and then search for "ExactaMix." Due to the shortage, Baxter is setting the allocation of the valve set (product codes H938792 and H938724)

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Preliminary comparative data workbook now available!

The ***Preliminary Comparative Data from the ISMP Medication Safety Self Assessment for Perioperative Settings*** is now available to study participants who submitted their entire assessment findings to ISMP. The workbook contains 5 tables and 21 graphs of aggregate data that can be used by participants to compare their results to the aggregate results of demographically similar US facilities. Excel worksheets are also provided to help facilities identify opportunities for improvement and establish perioperative medication safety priorities based on their findings. To access the workbook and associated worksheets for your facility type (i.e., hospital vs. ambulatory), log in to your account at: http://ismpassessments.org/peri/, and click on the links titled "Results Workbook" and "Results Worksheets" in the top right corner of the page. Thank you again to the many hospitals and ambulatory facilities that participated in the assessment. For questions, please contact ISMP at: selfassess@ismp.org.

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(www.ismp.org/node/160); utilizing the framework of the ISMP ***Key Elements of the Medication Use System*** (www.ismp.org/node/895; www.ismp.org/node/541) to identify the contributing factors and underlying causes of medication errors; and referencing the ***ISMP Hierarchy of Error-Reduction Strategies*** (**Figure 1**) (www.ismp.org/node/18343).

③ **Promote a Just Culture.** Practitioners associated with ISMP expressed a sincere desire to work within a Just Culture. Recognizing the leadership-driven cultural transformation that must occur to truly implement and maintain a Just Culture (www.ismp.org/node/692; www.ismp.org/node/670), some practitioners provided unique examples of how they would pique (or have piqued) the interest of leadership to further explore what Just Culture could mean for their organizations and how it would help them achieve better outcomes:

- Develop compelling medication safety presentations to help staff understand the tenets of a Just Culture
- Hold discussions with leaders, human resources, and other influencers (e.g., medical staff leaders) to reach the tipping point for executive commitment to a Just Culture
- Create a team of Just Culture champions
- Be far more aware of at-risk behaviors and workarounds, get managers and leaders to collaborate with frontline staff to better understand the reasons for at-risk behavioral choices, implement high-leverage system changes based on these collaborations, and coach at-risk behaviors before errors result
- Teach managers what good system design looks like and how to help employees make better decisions

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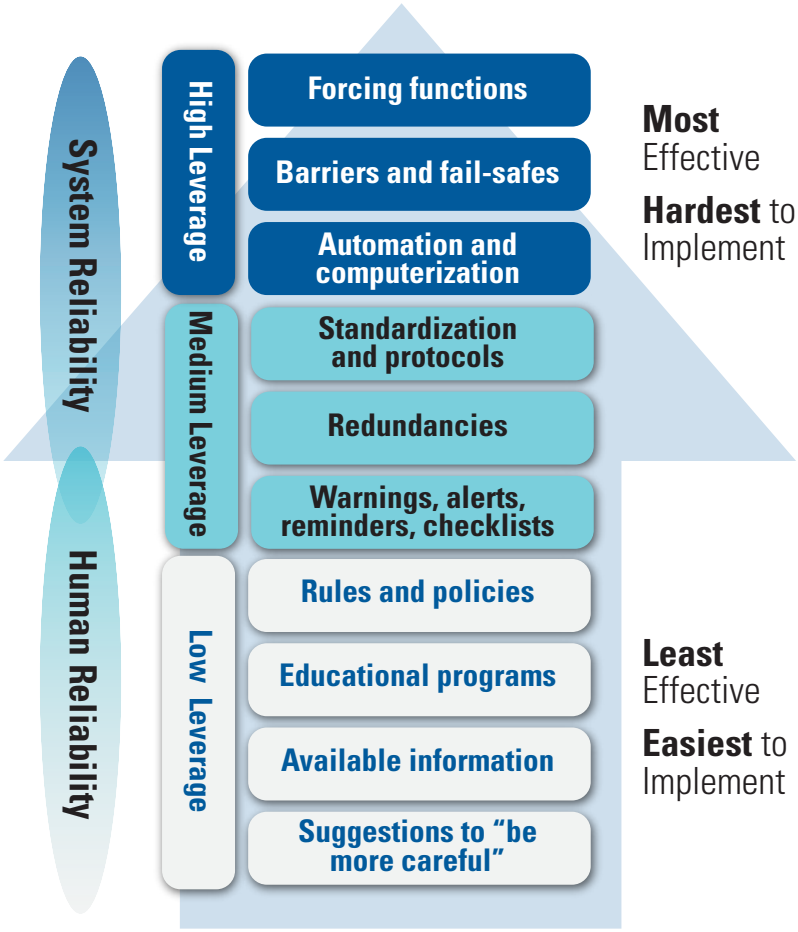
Figure 1. ***ISMP Hierarchy of Error-Reduction Strategies***



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at 65%. We encourage hospitals impacted to develop an internal team to plan and initiate conservation and mitigation strategies. ISMP is working with the American Society of Health-System Pharmacists (ASHP), the American Society for Parenteral and Enteral Nutrition (ASPEN), and the National Home Infusion Association (NHIA) to develop further guidance and potential conservation and mitigation strategies for organizations to consider during the valve shortage. Please contact Baxter Medical Affairs (medinfo@baxter.com) for further details.

Potential for mix-ups between Evusheld and Imfinzi. An organization reported potential confusion between vials of **EVUSHELD** (tixagevimab 150 mg/1.5 mL, cilgavimab 150 mg/1.5 mL) for intramuscular (IM) injection and **IMFINZI** (durvalumab 500 mg/10 mL) for intravenous (IV) injection. Under an Emergency Use Authorization (EUA), Evusheld is used for pre-exposure prophylaxis against coronavirus disease 2019 (COVID-19) in immunocompromised patients or for those who cannot be vaccinated. Imfinzi

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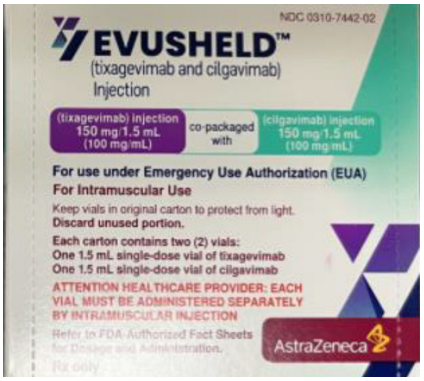

Figure 1. Principal display panels on cartons of Evusheld (top) and Imfinzi (bottom) look similar.

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④ **Share risks with colleagues.** Many practitioners associated with ISMP felt it was important to share known and suspected risks (hazards) with their colleagues to enhance awareness. For example, several pharmacists previously associated with ISMP had improved communication with prescribers upon returning to practice, noting they were no longer fearful about reaching out to prescribers to clarify unfamiliar or unusual orders. One practitioner pointed out that he often shares known or suspected risks with other practitioners in person, asking them if they were aware of the risk and if they have any ideas for improvement. Another practitioner noted that she had taken pictures of problematic packaging and sent them to internal colleagues as well as to ISMP. Still another practitioner noted that her organization now uses a dashboard and shares data about clinical risks with all levels of the organization.

⑤ **More comprehensive event investigation.** Many practitioners associated with ISMP would develop (or have developed) investigative depth behind why human errors, at-risk behaviors, and reckless behaviors occur, uncovering the deep system-based causes of events, or latent failures. These practitioners said they would try to steer clear of the common pitfalls when conducting an event investigation (www.ismp.org/node/803). For example, they would avoid making assumptions and instead investigate all questions or concerns, and they would routinely employ systems thinking, always searching for upstream factors that contributed to the event. During event investigation, one practitioner said she now identifies each phase of the medication-use process that could be involved in or affected by an error or hazard, and then targets each of these phases for risk-reduction strategies.

⑥ **Develop safety teams**. If they returned to practice, numerous practitioners said they would establish (or have established) a team of medication safety champions in key clinical units specifically to support medication safety priorities. The team would conduct daily safety huddles with unit staff to update and engage managers in medication safety priorities and to uncover safety gaps as well as successes. The team would also participate (or has participated) in weekly Patient Safety Leadership WalkRounds (Frankel A. Patient safety leadership WalkRounds. Institute for Healthcare Improvement. 2004. www.ismp.org/ext/890) to learn about patient safety issues and the culture. Another resource, Positive Leadership WalkRounds (Sexton JB, Adair KC, Profit J, et al. Safety culture and workforce well-being associations with Positive Leadership WalkRounds. *Jt Comm J Qual Patient Saf*. 2021;47[7]:403-11. www.ismp.org/ext/891) was mentioned by one survey respondent as a way to learn about patient safety issues or successes, targets for special recognition, staff work-life balance, and the burnout climate.

⑦ **Advocate for a full-time Medication Safety Officer (MSO).** Several practitioners associated with ISMP told us they would seek out an MSO position if they returned to practice, and a few prior ISMP practitioners noted they had advocated for a full-time MSO in their organizations. One practitioner hoped to change the MSO reporting structure from the pharmacy to an executive leader. When healthcare executives empower the MSO to act on medication safety concerns, and position them on the organizational chart where it will best enhance their ability to affect change, it helps to ensure that the organization will identify and learn from medication risks and errors (both internal and external), and implement high-leverage strategies to reduce or eliminate the negative consequences of medication errors (www.ismp.org/node/23126).

⑧ **Do not sacrifice safety for timeliness.** Several practitioners said, when they returned to practice, they no longer considered timeliness to be the most important dimension of drug dispensing or administration. While it is clearly important to start drug therapy as soon as possible, often the clinical need for quick dispensing and administration does not outweigh the safety of having a pharmacist review the order first. One practitioner said she no longer rushes the drug administration process (or refers to it as a "med pass" because it is so much more than just "passing" medications).

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is an immunotherapy used in the treatment of lung cancer. Both are manufactured by AstraZeneca and are packaged in the same sized cartons that share a similar color palette. The location of text and formatting of the principal display panel (**Figure 1**, page 2) and the carton's top flap (**Figure 2**) appear somewhat similar. The vials inside the carton are also the same size, both have white caps, and the vial labels look similar (**Figure 3**). Also, both medications may be compounded in an IV room, as preparation of an IM dose of Evusheld requires four vials in total, prepared in two separate syringes. Additionally, both products are stored in a refrigerator and are likely to be present in oncology centers, infusion centers, or ambulatory clinics. A mix-up between these medications could lead to an IM dose of Evusheld inadvertently administered IV, and vice versa.

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Figure 2. The top of the carton of Evusheld (top) and Imfinzi (bottom) look similar.

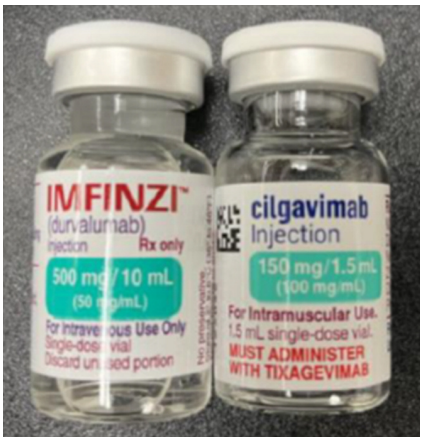

Figure 3. Imfinzi (left) and the cilgavimab component of Evusheld (right) vials both have white caps, and the labels look similar.

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She is now more realistic about the pharmacy turnaround time for routine medications and, when able, waits for the pharmacy to prepare and dispense intravenous (IV) solutions. Another practitioner noted that he would no longer rush the drug administration process, especially when handling high-alert medications.

⑨ **Involve an executive champion.** If they returned to practice after working at ISMP, several practitioners thought it would be critical to find a champion in medication safety among the upper executive leadership team (e.g., chief nursing officer, medical staff officer) who would help facilitate medication safety goals, especially if they received pushback. The support and confidence of a well-respected executive leader are essential to the infrastructure of a successful medication safety program as well as to the proactive adoption of organization-wide medication safety initiatives and technology.

⑩ **Conduct targeted education to staff and patients.** After being at ISMP, several practitioners told us they would provide targeted education to new staff members, including students and residents, about critical medication safety initiatives in each phase of the medication-use process, particularly when using high-alert medications. One practitioner said he would team with risk management to present targeted training programs based on past hazards, errors, and claims. Another practitioner, a pharmacist, would provide patient counseling more frequently in community pharmacies; instead of asking patients whether they have any questions for the pharmacist, she would counsel all patients who pick up a new prescription.

Conclusion

Our greatest teachers are practitioners who have made medication errors and have shared their experiences with others, including ISMP—they are our primary source of inspiration for change. Every day, each fellow, nurse, pharmacist, and physician at ISMP learns from practitioners who have bravely and altruistically shared their stories. These stories help ISMP clearly see the system vulnerabilities and uniquely understand why practitioners make errors and make risky choices while attempting to remedy a system problem. We hope the insight from our past fellows and the current ISMP staff is an inspiration for change for our readers, too.

Wrong directions–mL instead of mg–provided on the prescription label of pediatric propranolol oral liquid

Problem: Oral propranolol liquid was prescribed for a 7.2 kg 3-month-old baby with infantile hemangioma, a rapidly growing benign vascular tumor (www.ismp.org/ext/893). The pharmacy contacted the physician's office to clarify the order. When the patient's mother picked up the prescription, propranolol 20 mg/5 mL (4 mg/mL) was dispensed with the following instructions: "Administer 3.5 mL once on day 1, administer 3.5 mL twice daily for the next 6 days, then administer 7.5 mL twice daily for a maintenance dose." Based on the concentration dispensed, this would equate to 14 mg once on day 1 (1.9 mg/kg/day), 14 mg twice daily for the next 6 days (3.9 mg/kg/day), followed by 30 mg twice daily (8.3 mg/kg/day) for the maintenance dose. This maintenance dose is much higher than the typical daily oral maintenance dose (1 to 3 mg/kg/day) for infants and children for this indication.

When picking up the prescription, the mother was neither counseled nor provided with an oral syringe to administer the medication to her infant. After the mother returned home, she called the pharmacist to question the dose. The pharmacist confirmed that the dose was higher than recommended for a 7.2 kg infant with infantile hemangioma. However, the pharmacist stated, "It should be fine if this is how the doctor wanted it." If the mother was still concerned about the dose, the pharmacist suggested calling the physician's office herself.

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The organization that reported this concern has placed the medications in separate refrigerators in different areas of the pharmacy. Their process is to pull Imfinzi for IV compounding and place it into a sealed bag along with the rest of the compounding materials for the specific patient. Evusheld is not brought into the sterile compounding room until the patient has arrived for the injection.

We also recommend utilizing barcode scanning technology during product preparation and prior to administration. Highlighting or circling the product names with a pen to draw one's eyes in that direction may assist in correct product selection.

Risky shortened drug names. A close call occurred in a hospital operating room when a surgeon asked for "**PITOCIN**" (oxytocin) and a nurse entered "PIT" into an automated dispensing cabinet (ADC) and mistakenly selected and retrieved **PITRESSIN** (vasopressin). The patient was a healthy 19-year-old woman who almost received Pitressin instead of Pitocin. Fortunately, an anesthesia attending physician noticed the error before the wrong drug was administered. The pharmacy was notified and the brand name field was updated to remove Pitressin and replace it with **VASOSTRICT**, which is the actual brand product carried in the facility. Vasopressin is no longer available by the brand name Pitressin in the US.

The same error has been reported to ISMP many times in the past. In addition, other errors associated with stemming, truncating, or otherwise shortening drug names has led to confusion and mix-ups. For example, ask for a "nitro drip" and you could wind up with nitroprusside or nitroglycerin. When you see this happening, teach others about the dangers of shortening drug names. Also, to reduce the risk of mix-ups, we have frequently recommended entering at least five letter characters when selecting drug names via override or from an unprofiled ADC, or when searching and selecting drug names from other computer screens.

> **Propranolol oral liquid** — continued from page 4

The mother followed up with the prescriber to express her concerns and to relay that the pharmacist assured her that the dosing instructions she received matched what was on the original prescription. The prescriber confirmed that the dosing directions provided by the pharmacy were incorrect. The prescriber told the mother that, when the pharmacist called for clarification, the physician's office staff person who answered the call must have mistakenly communicated the dosing instructions in mL, not mg. The intended instructions were "3.5 mg (0.88 mL) for the first day (0.49 mg/kg/day), 3.5 mg (0.88 mL) twice daily for the following 6 days (0.97 mg/kg/day), followed by 7.5 mg (1.88 mL) twice daily (2.1 mg/kg/day) for the maintenance dose." Fortunately, the infant's mother kept questioning the directions and the error was caught before the infant was given the medication.

Safe Practice Recommendations: There are three propranolol oral liquid concentrations available, including two concentrations of generic products, 20 mg/5 mL (4 mg/mL) and 40 mg/5 mL (8 mg/mL), and a different concentration for a brand product, **HEMANGEOL**, 4.28 mg/mL. To avoid confusion among the multiple concentrations, and also between mg and mL doses, propranolol oral liquid doses should always be prescribed in mg. Prescribers should include the patient's weight in metric units on the prescription. Otherwise, pharmacists will need to confirm the weight so they can calculate and verify the mg/kg dose. If the dose is outside of the normal range, pharmacists should clarify the order directly with the prescriber, referring to the mg dose. Once the drug has been prescribed in mg, pharmacists may need to calculate and transcribe the mL dose based on the drug's concentration for the patient's instructions if the electronic prescribing system does not calculate the volume automatically. Then, if the volume amount must be entered manually, an independent double check of the calculation should be required.

Labels on prescription oral liquids should specify the dose in mL in the instructions for use for the patient/parent to measure each dose, and then the product's concentration should be listed elsewhere on the label. Weight-based medication doses should be rounded and/or standardized automatically to a dose that is not greater than or less than 10% of the originally prescribed dose. For example, 3.5 mg (0.88 mL) of propranolol 4 mg/mL should be rounded to 3.6 mg (0.9 mL) to facilitate the ease of measuring doses. Pharmacies should provide patients with an appropriately sized metric-only oral syringe or dosing cup for safe dose measurement and administration of oral liquids. Pharmacists should also teach patients/parents how to measure each dose by employing the "teach-back" method using the dosing device, which incorporates a return demonstration by the patient/parent to confirm their ability. Importantly, when patients/parents express a safety concern, stop, listen, and investigate to confirm that there are not any errors (review our article, *Be wary of "misspeakers" who "shoot from the hip"* at: www.ismp.org/node/559).

Incidentally, Hemangeol is the only liquid propranolol approved by the US Food and Drug Administration (FDA) for the treatment of proliferating infantile hemangioma requiring systemic therapy. The generic products are used off-label for this indication. In the US, the existing generic propranolol solutions are expressed in terms of propranolol hydrochloride, and FDA had previously requested that Hemangeol dosages and concentration be communicated similarly. Outside the US, the Hemangeol concentration is expressed as 3.75 mg/mL of propranolol base, which is equivalent to 4.28 mg/mL. Unfortunately, the Hemangeol 4.28 mg/mL concentration can add to the risk of dosage calculation errors when compared to the available generic 4 mg/mL or 8 mg/mL concentrations.

Special Announcements

FREE ISMP and The Just Culture Company webinar

Are you troubled by the criminalization of a medical error and the guilty verdict against **RaDonda Vaught**? How do you come to the right conclusions about accountability? Are you looking for ways to prevent similar events with neuromuscular blocking agents in your own organization? To kick off the celebration of ***Nurses Week*** (May 6 to 12), join leaders from ISMP and The Just Culture Company on **May 6, 2022**, between 1:00 and 2:30 pm ET, for a **FREE** webinar, ***Lessons Learned about Human Fallibility, System Design, and Justice in the Aftermath of a Fatal Medication Error***. The speakers will describe common system vulnerabilities as well as key strategies to further advance your safety journey and help prevent this tragedy from happening again. To register, visit: www.ismp.org/node/31106. Also, view a statement from ECRI and ISMP about the recent criminal conviction of RaDonda Vaught at: www.ismp.org/node/31129.

Virtual MSI workshops

Don't miss the opportunity to register for one of our unique 2-day, virtual ***ISMP Medication Safety Intensive (MSI)*** workshops being offered in 2022. Our next workshop is scheduled for **June 9 & 10, 2022**. For more dates in 2022 and to register, visit: www.ismp.org/node/127.

Reminder: Please take our survey!

Please take our readership survey regarding how you use the newsletter and your overall satisfaction with the ***ISMP Medication Safety Alert! Acute Care***. Submit your responses to this important survey by **May 13, 2022**, by visiting: www.ismp.org/ext/863. Your participation will help us cover important topics that are of interest to you, as well as improve the newsletter to better serve you and your patients.

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ISMP Medication Safety Alert!® ActionAgenda

One of the most important ways to prevent medication errors is to learn about problems that have occurred in other organizations and to use that information to prevent similar problems at your practice site. To promote such a process, the following selected items from the **January – March 2022** issues of the ***ISMP Medication Safety Alert! Acute Care*** have been prepared for leadership to use with an interdisciplinary committee or with frontline staff to stimulate discussion and action to reduce the risk of medication errors. Each item includes a brief description of the medication safety problem, a few recommendations to reduce the risk of errors, and the issue number to locate additional information. Look for our high-alert medication icon under the issue number if the agenda item involves one or more medications on the ***ISMP List of High-Alert Medications*** (www.ismp.org/node/103). The Action Agenda is also available for download in a Microsoft Word and Excel format (www.ismp.org/node/31218) that allows expansion of the columns in the table designated for organizational documentation of an assessment, actions required, and assignments for each agenda item. Continuing education credit is available for nurses at: www.ismp.org/nursing-ce.

Key: ⚠ — ISMP high-alert medication

Issue No.	Problem	Recommendations	Organization Assessment	Action Required/Assignment	Date Completed
Survey results on disrespectful behaviors in healthcare and how to address them					
(4, 5)	Results of our 2021 survey revealed widespread disrespectful behaviors involving multiple offenders at all levels and among all disciplines, genders, and ranks. Compared to the results of our 2003 and 2013 surveys, little or no improvement has been made, and in some cases, the frequency has worsened. Disrespectful behaviors have led to unsafe practices, medication errors, and adverse patient outcomes. Most respondents were not satisfied with organizational efforts to address disrespectful behaviors.	Transformation to a Just Culture, transparency so staff feel safe speaking up, and leading by example are key to creating a respectful culture. Establish a committee to create a code of conduct, investigate all reports of disrespectful behaviors, develop a response to disrespectful behaviors determined by the seriousness and frequency of the event, and measure the success of actions taken. Implement a confidential reporting program with a "no retribution" policy for reporting. Support staff who experience, witness, or have been accused of disrespectful behavior while the event is investigated.			
Analysis identifies multiple common causes of norepinephrine errors					
(6) ⚠	Analysis of 122 norepinephrine errors in the past 2 years revealed these common contributing factors: non-standard prescribing (mg/kg/minute, mg/minute) without using an order set; rigid titration parameters; compounding errors; hidden labels due to light-protective bags; look-alike labeling; low par levels in patient care units; pump programming errors; not labeling and tracing lines when starting/restarting an infusion; and not anticipating when the next bag was needed.	Standardize to a limited number of concentrations and make them visually distinctive prior to dispensing. Choose a single dosing method and require prescribers to use a standard order template. Purchase available manufacturer premixed solutions and/or solutions from an outsourcer. Ensure adequate par levels in floor stock, and scan each bag or vial during preparation, dispensing, stocking, and administration. Use smart pumps and implement interoperability. Once an infusion has been discontinued or paused, disconnect it from the patient.			

Issue No.	Problem	Recommendations	Organization Assessment	Action Required/Assignment	Date Completed
Top 10 medication errors and hazards from 2021					
(2) ⚠	The top 10 safety concerns in our 2021 newsletters included four associated with the coronavirus disease 2019 (COVID-19) vaccines (i.e., preparation errors; mix-ups between adult and pediatric formulations, flu vaccines, and **EPINEPH**rine syringes); errors with hypertonic sodium chloride; errors with paused or discontinued infusions; infection risks with shared glucometers and insulin pens; adverse glycemic events; and the need to increase error reporting and create a medication safety officer position.	These safety concerns warrant your attention and priority in 2022 given the serious consequences of an error. Review the list of errors and hazards in detail and implement the recommended actions to mitigate these risks (www.ismp.org/node/29489). Include strategies to prevent similar errors and hazards in your 2022 strategic medication safety improvement plan.			
Three new *Best Practices* in the *2022-2023 ISMP Targeted Medication Safety Best Practices for Hospitals*					
(3) ⚠	The updated *Best Practices* document has three new *Best Practices,* #17: Safeguard against errors with oxytocin use; #18: Maximize barcode verification prior to drug and vaccine administration by expanding its use beyond inpatient care areas (e.g., emergency departments, perioperative areas); and #19: For high-alert medications, layer strategies throughout the medication-use process to improve safety.	ISMP encourages hospitals to implement the three new *Best Practices* as well as the older ones (www.ismp.org/node/160). Helpful resources include Frequently Asked Questions (www.ismp.org/node/14369) and an Implementation Worksheet (www.ismp.org/node/1506). Implementation of the *Best Practices* can vastly improve medication safety and reduce the risk of significant patient harm.			
Do NOT dilute gray-capped Pfizer-BioNTech coronavirus disease 2019 (COVID-19) vaccines					
(3)	The Pfizer-BioNTech COVID-19 vaccine for individuals 12 years and older is available in vials with two different colored caps. The vaccine with a purple cap must be diluted, while the product with a gray cap is prediluted. ISMP received a report of erroneous dilution of the vaccine in the gray-capped vial.	When possible, switch entirely to the prediluted gray-capped vaccine for ages 12 and older. If both the gray- and purple-capped vaccines are in stock, separate them, require an independent double check during preparation, and provide the updated *Fact Sheet* for the emergency use authorization vaccine or the package insert for **COMIRNATY**.			

Issue No.	Problem	Recommendations	Organization Assessment	Action Required/Assignment	Date Completed
Cardiovascular events associated with stopping and restarting cloZAPine					
(1)	An outpatient had not taken cloZAPine 500 mg daily for 2 weeks due to a prescribing delay. Upon hospitalization, she was restarted on cloZAPine 400 mg daily but was found pulseless after the first dose. A boxed warning describes the risk of severe cardiovascular events during the initial titration period. A similar risk exists when the drug is stopped and restarted after 2 days or more, but this is not effectively communicated to practitioners.	When restarting cloZAPine after a break in therapy of 2 days or longer, begin at a dose of 12.5 mg once or twice daily. Educate providers about the potential for adverse cardiovascular events, especially during initial dose titration and re-initiation of therapy. Confirm the patient's dose and date of the last administration prior to prescribing therapy. Dose titration parameters for new starts and restarts may be helpful.			
Managing drug shortages with 0.9% sodium chloride, sterile water for injection, and EPINEPHrine					
(1) ⚠	Shortages of 0.9% sodium chloride vials, flush syringes, and small volume bags; sterile water for injection vials; and EPINEPHrine syringes and autoinjectors can lure practitioners into unsafe practices, risking contamination, disease transmission, and incorrectly prepared medications. Examples include unnecessary and unsafe medication dilution in prefilled saline flush syringes and using a common-source bag/bottle outside of the pharmacy to prepare sterile water or saline syringes.	Examine current usage and develop conservation strategies for products in short supply. Reserve 10 mL vials of 0.9% sodium chloride for use in code cart kits (with EPINEPHrine). **DO NOT** use common-source containers to prepare solutions outside of the pharmacy. In a complete outage, have the pharmacy prepare saline flushes, repackage sterile water into sterile vials, and **ONLY** during codes, withdraw EPINEPHrine into an empty syringe and use a transfer device to withdraw saline from a flush syringe into the pre-drawn EPINEPHrine syringe. **DO NOT** dilute medications directly in a prefilled flush syringe.			
Recurring mix-ups with look-alike bags of INTRALIPID (lipid injectable emulsion [ILE]) and VIPERSLIDE					
(2)	Mix-ups between ViperSlide and ILE were reported. Both are milky white and come in bags with blue and white ports. ViperSlide, a non-drug lubricant, has a lower lipid concentration (10%) than ILE (20%). If ViperSlide is given instead of ILE to treat a local anesthetic overdose, the impact is unknown.	If both of these products are available, avoid storing ViperSlide in the pharmacy (even in an operating room [OR] pharmacy), in a perioperative medication room, or in an automated dispensing cabinet (ADC) where lipid rescue kits are stored. Place "Caution: Surgical Lubricant" auxiliary labels on ViperSlide bags to help differentiate them from ILE bags.			

Issue No.	Problem	Recommendations	Organization Assessment	Action Required/Assignment	Date Completed
Tubing spikes drop from intravenous (IV) bags while in use					
(3)	IV tubing spikes have fallen out of IV bags prepared by 503B outsourcers using Douglas Medical Products (DMP) bags, or the bags have leaked when using a Baxter administration set (2C8541). This could cause waste, therapy interruptions, contamination, incorrect dosing, exposure to hazardous drugs, and controlled substance accountability issues.	Instruct nurses to insert IV spikes into bag ports using a single motion with a firm twist. The spike should not be wiggled, removed, or reinserted as this could loosen the connection. Although some 503B outsourcers like QuVa have stopped using the DMP bags, unused and unexpired products may still be available in organizations and from other 503B outsourcers.			
US Food and Drug Administration (FDA) warns about the risk of medical tubing entanglement in children					
(4)	FDA issued a warning about pediatric patients getting tangled in their enteral feeding sets after receiving reports of two toddlers who died this way (www.ismp.org/ext/849). Strangulation risks also exist with intravenous (IV) or oxygen tubing, electrical cords, and monitor leads, especially if children are mobile.	Direct supervision, use of accessories to stabilize flexible lines, video surveillance systems, and assessing the need for continuous rather than intermittent IV infusions (e.g., saline or heparin locked IV sites) are recommended. A tool is also available to help assess the strangulation risk in children (www.ismp.org/ext/855).			
Do not use nonspecific PRN (as needed) frequencies for medication administration					
(4)	Nonspecific frequencies such as BID PRN, TID PRN, and QID PRN do not provide clear directions regarding the time interval between doses. They lead to variability in interpretation, which may cause patient harm.	Prescribers should define the minimum time between PRN doses, such as "every 8 hours PRN," and include the indication. Order entry systems should not allow nonspecific PRN frequencies as part of an order.			
Avoid using tuberculin (TB) syringes with orange caps					
(4) ⚠	Monoject TB (1 mL) syringes from Cardinal Health have an orange cap over the ⅝ inch 25-gauge needle. The International Organization for Standardization (ISO) recommends an orange (or uncolored) cap when it covers a 25-gauge needle. These TB syringes risk confusion with orange-capped insulin syringes, which could lead to a dosing error.	ISMP was able to identify other TB syringe brands that do not use an orange-capped 25-gauge needle on their TB syringes. So, please work with your wholesalers to avoid this potential problem. We have also shared this information with Cardinal Health and asked them to reconsider the use of an orange-capped 25-gauge needle on their TB syringes, which they agreed to discuss internally.			