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ISMP Institute for Safe Medication Practices
An ECRI Company

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

Take action on the top five themes identified during ISMP consultations

Seeking expertise from external sources and learning about errors that have occurred in other hospitals prompts the evaluation of similar risks within your own organization that may otherwise be hidden, lying dormant for years before they cause or contribute to an adverse outcome. Described below are five themes that ISMP consulting services staff frequently encounter during hospital consulting engagements, many of which relate to one of our ISMP ***Targeted Medication Safety Best Practices for Hospitals***.

Theme 1: Patient Weights

There is a common practice to weigh patients in pounds rather than kilograms or grams in the United States. Some organizations' digital scales do not default to metric units, or they allow practitioners to toggle between pounds and kilograms. In addition, some electronic health record (EHR) systems allow practitioners to enter weight in pounds/ounces or kilograms/grams, and the user is required to type "lb" or "kg." This practice has been linked to errors, where the patient's weight in pounds was entered as kilograms and vice versa.

Organizations should measure and document patient weights in metric units only (*Best Practice 3*). If scales can measure in both pounds/ounces and kilograms/grams, modify the scale to lock out the ability to weigh in pounds/ounces, so only metric units are displayed. If purchasing or replacing scales, buy new scales that measure in, or can be locked to measure in, metric units only. Have resources (e.g., charts) that convert from kilograms (or grams for pediatrics) to pounds available near all scales, so that patients/caregivers/parents can be told the weight in pounds, if requested. Ensure that EHR screen views and medication device screens (e.g., infusion pumps) prompt for the patient's weight in metric units only.

Theme 2: Patient ID and BCMA

There are inconsistencies in patient identification (ID) processes across different patient care areas within an organization. In some locations, particularly in ambulatory settings, patients may not receive ID bands. There are also challenges with barcode scanning devices, including not having a sufficient number of wireless handheld devices available, leading to delays in medication administration. In addition, barcode medication administration (BCMA) is not consistently used for all medications and vaccines, especially in outpatient areas, emergency departments (EDs), and certain diagnostic and procedural areas.

Barcode scanning is critical for safe medication use. Standardize patient ID processes across all areas where patient encounters occur and ensure all patients receive and wear an ID band that is scanned before any test or procedure is initiated, or medication is administered. Regularly review compliance and other metrics to assess utilization and effectiveness of this safety technology (e.g., scanning compliance rates, bypassed or acknowledged alerts). Address challenges with barcode scanning compliance by improving scanner reliability and ensuring sufficient handheld devices are available. *Best Practice 18* calls for maximizing the use of barcode verification prior to medication and vaccine administration by expanding use beyond inpatient care areas. Specifically target clinical areas with an increased likelihood of a short or limited patient stay

continued on page 2 — Top five themes >

SAFETY briefs

Warning! Overwrap labeled potassium chloride 10 mEq/100 mL may contain potassium chloride 20 mEq/50 mL premixed IV bag. A prescriber ordered a potassium chloride 10 mEq/100 mL infusion for a patient with a peripheral intravenous (IV) line. The nurse removed a bag from the automated dispensing cabinet (ADC) labeled potassium chloride 10 mEq/100 mL (NDC 0990-7074-26) by ICU Medical and scanned the barcode on the overwrap. The nurse opened the overwrap, read the infusion bag label, and identified that it was labeled potassium chloride 20 mEq/50 mL (NDC 0990-7077-14, lot number 1030613) (**Figure 1**). The hospital quarantined the overwrap and infusion bag and notified ICU Medical. The hospital did not find additional infusion bags with this issue.

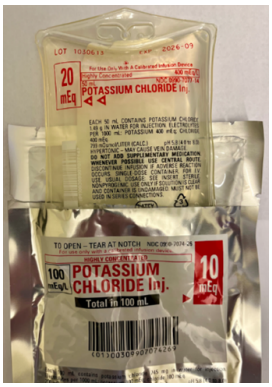

Figure 1. A hospital reported that ICU Medical's overwrap labeled potassium chloride injection 10 mEq/100 mL contained an infusion bag labeled potassium chloride injection 20 mEq/50 mL.

On February 13, 2025, ICU Medical issued a recall of potassium chloride injection due to mislabeling involving a different lot number (1023172). An overdose of potassium chloride can lead to patient harm, including hyperkalemia and cardiac dysrhythmia. If the more highly concentrated potassium chloride product is inadvertently infused via a peripheral IV line, this could also lead to vein irritation and pain.

We have reached out to the US Food and Drug Administration (FDA) and ICU Medical to notify them of this concern. ICU Medical informed

continued on page 2 — SAFETY briefs >

> Top five themes — continued from page 1

(e.g., ED, perioperative areas, infusion clinics, dialysis centers, radiology, labor and delivery areas, catheterization laboratories, outpatient areas). Complete walk rounds to understand practices that lead to BCMA workarounds. BCMA may be suboptimally implemented due to issues with software (e.g., EHR configuration, connectivity) or hardware (e.g., broken or missing scanners). Develop and implement strategies that address system issues and support safe clinical workflow.

Theme 3: Medication Reconciliation

Medication reconciliation is inconsistently performed, particularly during transitions of care and at discharge. Organizations do not always allocate resources for completing accurate medication histories as close to the time of admission as possible. There is often a lack of clarity in the role of the prescriber, nurse, pharmacist, and pharmacy technician during the medication reconciliation process. For example, some organizations do not designate or have a clear expectation as to which practitioner is responsible for removing outdated medications from the patient's home medication list.

Best Practice 21 specifies the need to assign dedicated and trained practitioners to obtain thorough medication histories. Ideally, this list would be available to providers before admission orders are written so that they can compare the planned medications to those on the medication history list to ensure they are appropriate and then resolve any discrepancies. Providers need to document reconciliation and modifications made to the current therapy upon admission, with each transition of care, and at discharge. Develop a system-wide medication reconciliation policy that addresses the steps in the reconciliation process, defines the specific roles of each practitioner (e.g., pharmacy technician, pharmacist, prescriber, nurse) in the process, and the expectations during transitions of care and at discharge. Utilize specific process measures to monitor the success of the medication reconciliation process.

Theme 4: Opioid Status Management

Organizations do not clearly define the terms "opioid-naïve" or "opioid-tolerant" and what each practitioner's role is regarding pain management. Most organizations that were visited do not require practitioners to assess and document the patient's opioid status on admission or to assess if the patient is at high risk for opioid-induced respiratory depression before prescribing, dispensing, or administering opioid medications. Practitioners are not educated during orientation or annually on the treatment differences based on a patient's opioid status.

Organizations must ensure that a patient's opioid status and risk for opioid-induced respiratory depression is evaluated and documented in the EHR before ordering, verifying, or administering opioids. Establish a process to verify and document a patient's opioid status (naïve versus tolerant) and the type of pain (acute versus chronic) before prescribing and dispensing extended-release and long-acting opioids (*Best Practice 15*). For adults, opioid-tolerance may be defined as patients receiving, for 1 week or longer, at least: 60 mg oral morphine/day; 25 mcg transdermal fenta**NYL**/hour; 30 mg oral oxy**CODONE**/day; 8 mg oral **HYDRO**morphone/day; 25 mg oral oxy**MOR**phone/day; 60 mg oral **HYDRO**codone/day; or an equianalgesic dose of another opioid, including heroin and/or non-prescribed opioids. Patients who do not meet "opioid-tolerant" criteria are considered "opioid-naïve" and require lower starting doses of opioids or alternative analgesics for pain management. Default order entry systems to the lowest initial starting dose and frequency when initiating orders for extended-release and long-acting opioids. Build clinical decision support (CDS) to alert practitioners when extended-release and long-acting opioid dose adjustments are required due to age, renal or liver impairment, or when patients are prescribed other sedating medications.

continued on page 3 — Top five themes >

>SAFETY briefs

cont'd from page 1

us that they are conducting an investigation. If your organization has purchased this product, notify staff to be vigilant when checking the infusion bag labels for all ICU Medical's potassium chloride injection bags prior to barcode scanning and administration, regardless of the lot. If impacted product is found, sequester it until the manufacturer provides further instructions. While this is an unusual situation, the best practice is to scan the barcode directly on an infusion bag (not the overwrap) prior to administration. Report issues to ISMP, FDA, and ICU Medical.

IV push propofol almost administered via amnioinfusion line. A prescriber ordered a 1 L bag of 0.9% sodium chloride to be administered via amnioinfusion for a pregnant patient in the labor and delivery unit who was experiencing prolonged fetal deceleration. The nurse initiated the amnioinfusion of 0.9% sodium chloride via a port in the patient's intrauterine pressure catheter (IUPC). Shortly after, it was determined that the patient needed to be transferred to the operating room (OR) for an emergency cesarean section. The nurse removed the patient's medication infusions from the intravenous (IV) pole, including the 0.9% sodium chloride infusion bag being administered via amnioinfusion, and placed them on the bed with the patient for transfer. Once in the OR, the fetal heart rate continued to drop, and the anesthesiologist decided that general anesthesia was needed for delivery. The anesthesiologist administered propofol via IV push for induction. Shortly after, the anesthesiologist realized that propofol was leaking on the floor and identified that they had inadvertently pushed it through the patient's amnioinfusion line. Fortunately, the amnioinfusion line had been disconnected from the patient during transport, resulting in a close call that did not reach the patient. The anesthesiologist administered the propofol through the patient's IV line, and the baby was delivered via cesarean section.

During the event investigation, several contributing factors were identified: portless tubing was not used for the amnioinfusion as it should have been; the amnioinfusion line was not labeled; the anesthesiologist

continued on page 3 — SAFETY briefs >

> Top five themes — continued from page 2

Theme 5: Clinical Decision Support (CDS)

There is an opportunity to enhance CDS during medication prescribing and verification. Collection of essential patient information, such as allergies and weight, is not enforced with hard stops during prescriber order entry or pharmacist verification. In addition, some EHR systems have safety gaps that allow critical warnings (e.g., anaphylactic reaction to a medication) to be easily bypassed by prescribers and pharmacists. Renal dose adjustments, drug-allergy interactions, and drug-diagnosis warnings often lack effective alerts or are easily overridden. Prescribers intending to order methotrexate for weekly administration may have an option to select an every 12-hour frequency from a dropdown list, or there may not be a hard stop to verify an appropriate oncologic indication for any daily oral methotrexate orders. Management of medications with specific formulary restrictions may rely on the verifying pharmacist to remember which drugs have restrictions and the medication-specific limitations for use.

Organizations must have a standardized process and build required fields to document essential patient information before prescribing or verifying medications. Enhance CDS systems by implementing critical medication warnings, including those related to dose range checking, renal dosing, drug-allergy interactions, and drug-disease state interactions. Hard stops should be used to prevent absolute contraindications or catastrophic errors. For example, require a hard stop verification of an appropriate oncologic indication for any daily oral methotrexate orders (*Best Practice 2*). Gather metrics regarding CDS override reasons to determine whether practitioner-documented reasons and/or overrides of warnings are appropriate. Monitor for nuisance alerts and refine system settings as needed. Additionally, move toward electronic management of formulary restrictions and Risk Evaluation and Mitigation Strategies (REMS) requirements instead of relying on pharmacists to manually recall specific drug limitations.

Summary

We encourage organizations to review and learn from these five commonly occurring risks and mitigation strategies. Whether you are an individual healthcare organization, pharmacy, ambulatory care practice site, long-term care facility, or represent a large multi-site healthcare enterprise, ISMP Consulting Services can help proactively identify hidden vulnerabilities and provide you with an unbiased analysis, a customized roadmap, and ongoing guidance to significantly reduce and prevent harm within your organization. For more information visit: ***Consulting Solutions***.

Worth repeating...

Patient given oral cromolyn via nebulizer—again!

A prescriber ordered cromolyn nebulization solution via inhalation for a hospitalized patient to treat bronchospasm. However, the pharmacy dispensed a nearly identical-looking cromolyn oral solution concentrate, made by Woodward. A nurse administered a dose of the oral solution via nebulization to the patient before identifying the error. Fortunately, no harm was reported.

The outer package states, "FOR ORAL USE ONLY—NOT FOR INHALATION OR INJECTION" (**Figure 1**, page 4), but once the medication is removed from the foil packaging, the plastic unit dose containers (**Figure 2**, page 4) look identical to nebulized solutions for inhalation. In addition, the plastic containers have difficult-to-read embossed information and do not have a barcode.

We previously wrote about this issue in our February 22, 2018 article, *Safety with nebulized medications requires an interdisciplinary team approach*, so it is ***Worth* repeating**. In one 2018 case, a hospitalized child received **GASTROCROM** (oral cromolyn solution) via nebulization

continued on page 4 — *Worth* repeating >

>*SAFETY* briefs

cont'd from page 2

did not trace the infusion line prior to administration; and the anesthesiologist was unfamiliar with the amnioinfusion procedure. The hospital completed a risk assessment and has implemented several changes: portless tubing (**Figure 1**) is now used for all amnioinfusions; amnioinfusion lines are now labeled (**Figure 2**); and the labor and delivery nurses and anesthesiologists received education about safe amnioinfusion processes, including the importance of using portless tubing for amnioinfusions and labeling and tracing all lines.

Figure 1. Portless tubing is now being used for amnioinfusions.

Figure 2. Amnioinfusion labels are now added to amnioinfusion lines.

We encourage organizations providing obstetrical care to learn from this event and complete a failure mode and effects analysis (FMEA) around amnioinfusion practices. Consider which pumps and infusion products are being used for amnioinfusions; ensure portless tubing is used, lines are labeled, and place the amnioinfusion pump away from IV pumps. When infusions are started, reconnected, or changed, trace the tubing from the solution container to the pump, to the connection port, and then to the patient to verify the proper infusion, pump/channel, and route of administration prior to scanning the barcode and administering the infusion to the patient. Communicate with the care team, especially during handoffs (e.g., from labor

continued on page 4 — *SAFETY* briefs >

>Worth repeating

continued from page 3

instead of the cromolyn inhalation solution. The child was receiving both forms of cromolyn, and the respiratory therapist mistakenly removed one of the oral cromolyn solutions from the patient's drawer and administered it via inhalation. The child was monitored but was not harmed.

Dispense and store the cromolyn oral and nebulization products in their original foil pouch and/or the original carton. Stock cartons/foil pouches of each nebulizer medication and oral solution in a separate pocket in an automated dispensing cabinet (ADC). Use barcode scanning to stock the ADC and to verify that the correct product has been placed in each pocket. Procure products whose unit doses are individually barcoded by the manufacturer. Otherwise, create a flag label that incorporates the appropriate barcode and attach it to the tab of the plastic container; avoid auxiliary labels or the use of ink directly on the part of the plastic container in contact with the solution, as volatiles can leach through the plastic. Educate staff on the risks of mix-up once individual plastic containers have been removed from the foil overwrap. Require nurses and respiratory therapists to use a barcode scanning system prior to the administration of oral and nebulized medications.

Figure 1. Cromolyn oral solution foil package looks similar to packaging for nebulization, although the foil wrap says, "FOR ORAL USE ONLY—NOT FOR INHALATION OR INJECTION."

Figure 2. Plastic containers of cromolyn oral solution are packaged similarly to the nebulization product.

>SAFETY briefs

cont'd from page 3

and delivery to the OR), specifically noting if a patient is receiving an amnioinfusion and trace all access lines as part of the handoff.

Monitor patients for unanticipated events and investigate tubing connections if clinical deterioration or an unexpected adverse effect is detected. During orientation and ongoing training, educate staff about safe amnioinfusion practices and stress the need to trace infusion lines. Practice tracing lines during periodic simulations. Share impactful stories, recognize staff for good catches, and report errors to ISMP.

Special Announcements

Work for ISMP

Help spread medication error prevention recommendations to the entire health-care community! ISMP is looking for a ***Medication Safety Specialist-Education*** who will be responsible for the coordination and implementation of our educational programming. Med Safety Board (MSB), an ISMP company powered by ECRI, is accepting applications for a full-time ***Director***. For more details on both positions and to apply, visit: *Job Opportunities*.

Apply for a JUST CULTURE scholarship

Applications are now being accepted for the ***Judy Smetzer Just Culture Champion Scholarships***. Qualifications to apply include the following: currently working in the healthcare field, having at least 5 years of full-time postgraduate experience, and a commitment from executive leadership within your organization. The deadline to apply is **September 30, 2025**. For more information and to submit an application, click here.

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Editors: Shannon Bertagnoli, PharmD; Ann Shastay, MSN, RN, AOCN; Rita K. Jew, PharmD, MBA, BCPPS, FASHP; Editor Emeritus, Michael R. Cohen, RPh, MS, ScD (hon), DPS (hon), FASHP. ISMP, 3959 Welsh Road, #364, Willow Grove, PA 19090. Email: ismpinfo@ismp.org; Tel: 215-947-7797.