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ISMP
An ECRI Affiliate

# Acute Care ISMP Medication Safety Alert!®

Educating the Healthcare Community About Safe Medication Practices

## Survey shows room for improvement with three new *Best Practices* for hospitals

In our February 10, 2022 newsletter (www.ismp.org/node/29718), we invited hospitals to participate in a short survey to establish a baseline of implementation for the three new *Best Practices* released in the 2022-2023 ***ISMP Targeted Medication Safety Best Practices for Hospitals*** (www.ismp.org/node/160). The three new *Best Practices* are associated with safeguarding against errors with oxytocin use (#17), expanding the use of barcode verification beyond inpatient care areas (#18), and improving safety with high-alert medications (#19). We want to sincerely thank the hospitals that participated in our survey and shared their valuable lessons learned regarding the barriers and enablers to implementation of the new *Best Practices*. An overview of the survey findings is presented in **Table 1** (page 4) and detailed below.

### Respondent Profile

One hundred eighty-eight (N = 188) hospitals participated in our *Best Practices* survey. Nearly one-third (30%) of the hospitals were large with 500 beds or more; 21% had 300-499 beds; 27% had 100-299 beds; 16% had 26-99 beds; and 6% had 25 beds or less. Overall, more than two-thirds of responding hospitals reported employing one or more part- or full-time medication safety officer(s) (MSO). The percentage of hospitals with an MSO was higher in large hospitals with 500 beds or more (98%) when compared to hospitals with 499 beds or less (63%). With few exceptions, large hospitals with more than 500 beds, especially those with an MSO, reported higher levels of implementation for expanding the use of barcode technology (#18) and layering strategies to improve the safety of high-alert medications (#19). However, small hospitals with less than 100 beds and mid-sized hospitals with 100-499 beds reported higher levels of implementation for safeguarding against errors with oxytocin use (#17).

### New *Best Practice* 17 Safe Oxytocin Use

New *Best Practice* #17 consists of five interventions designed to improve the safe use of oxytocin. The **first intervention** recommends the use of standard order sets for prescribing oxytocin antepartum and/or postpartum that reflect a standardized approach to labor induction or augmentation and the control of postpartum bleeding. Eighty-three percent of hospitals reported full implementation. All small hospitals with less than 100 beds reported full implementation. Anesthesia staff resistance to using a standard order set was the most frequently cited barrier to implementation, as were allowing prescribers to bypass the order set and accepting free-text orders. The most frequent enablers were the implementation of a *systemwide* standard order set and leadership *requiring* its use.

The **second intervention** recommends standardizing to a single concentration and bag size for both antepartum and postpartum oxytocin infusions. Overall, 84% of hospitals reported full implementation, with most respondents using a standard concentration of 30 units of oxytocin per 500 mL of lactated ringer's or 0.9% sodium chloride for both antepartum and postpartum infusions. Anesthesia staff resistance to using a single concentration for both purposes was the most frequently cited barrier to implementation. A few respondents also reported "supply issues" as a barrier, although 2020 was the last time oxytocin vials were reported to be in short supply. The most frequent enabler was to offer a single concentration in the electronic prescribing system and infusion pump drug library.

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## SAFETY briefs

HIGH-ALERT

**AuroMedics etomidate, pantoprazole, and bupivacaine mix-ups.** A close call was reported when a nurse retrieved a vial of pantoprazole, a proton pump inhibitor, from an automated dispensing cabinet (ADC) and discovered a few vials of etomidate mixed in with the pantoprazole. Although barcode scanning was used to refill the ADC, the process only requires one medication vial to be scanned among the many vials that were being replaced, so the misfill was not caught. Serious patient harm could have occurred if etomidate, an intravenous (IV) anesthetic, had been administered instead of pantoprazole.


**Figure 1.** Look-alike vials of etomidate (left) and pantoprazole (right) from AuroMedics.

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**Paxlovid Checklist**

The US Food and Drug Administration (FDA) has just posted a ***PAXLOVID Patient Eligibility Screening Checklist Tool for Prescribers*** on various FDA webpages, including www.fda.gov/media/158165/download. The checklist is intended to support clinical decision making for prescribers, but its use is not required to prescribe **PAXLOVID** (nirmatrelvir, ritonavir) under the emergency use authorization (EUA). The checklist provides prompts for important patient information to gather before prescribing. The tool also contains useful information to help pharmacists evaluate Paxlovid drug interactions.

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The **third intervention** recommends standardizing how oxytocin doses, concentrations, and rates are expressed; and communicating orders in terms of the dose rate, aligning this with the smart pump dose error-reduction system (DERS). For standardizing the expression of oxytocin doses, concentrations, and rates, 80% of hospitals reported full implementation. Small hospitals with less than 100 beds (92%) reported full implementation more often than hospitals with 100 beds or more (76%). The primary barrier to implementation was allowing different dosing based on the drug's indication (e.g., milliunits/minute for labor induction; units/hour for labor augmentation; mL/hour for postpartum bleeding). The most frequent enabler was to standardize the dosing units and concentration in order sets and the smart pump drug library. For communicating orders in terms of the dose rate and aligning this with smart infusion pump DERS, 82% of hospitals reported full implementation. The most frequently cited barrier was excluding oxytocin from infusion pump interoperability due to workflow challenges. Several respondents reported that reviewing oxytocin dose rate data during monthly meetings enabled them to address orders that were not communicated as a dose rate.

The **fourth intervention** recommends providing oxytocin in a ready-to-use form, as well as boldly labeling both sides of the infusion bag to differentiate oxytocin bags from plain hydrating solutions and magnesium infusions. Eighty-six percent of hospitals reported full implementation for providing oxytocin in a ready-to-use form (premixed by pharmacy or an outsourcer). Full implementation was greatest in small hospitals with less than 100 beds (92%), large hospitals with more than 500 beds (95%), and hospitals with an MSO (91%). Only 75% of hospitals without an MSO reported full implementation. Unavailability of a commercially available manufacturer premixed infusion and "supply issues" were cited as barriers to implementation. Enablers were requiring the pharmacy to prepare all infusions or purchasing premixed infusions from a compounding company. However, purchasing infusions from a compounding company was frequently listed as a barrier to labeling both sides of the infusion bag since compounders only label one side. Only 36% of hospitals reported full implementation of labeling both sides of the infusion bag.

The **fifth intervention** recommends not bringing an oxytocin infusion bag to the patient's bedside until it is prescribed and needed. Fifty-seven percent of hospitals reported full implementation, while another 36% reported partial implementation. Full implementation was greatest in hospitals with an MSO (59%) when compared to hospitals without an MSO (45%). Frequently cited barriers to implementation included nurse staffing shortages; nursing preference to have emergency medications in the patient's room; and the inability to leave the patient to retrieve an oxytocin infusion. No enablers were reported.

### New *Best Practice* 18 Expand Barcode Scanning Technology

New *Best Practice* #18 consists of two interventions to expand the use of barcode verification prior to medication and vaccine administration beyond inpatient care areas. The **first intervention** recommends targeting clinical areas with a short or limited patient stay. Overall, approximately two-thirds to three-quarters of hospitals reported full implementation of barcode technology in infusion clinics (76%), post-anesthesia care units (73%), labor and delivery (72%), dialysis centers (67%), emergency departments (65%), and perioperative holding areas (63%). Lower levels of full implementation were reported in radiology (31%), cardiac catheterization labs (23%), procedure rooms (16%), and operating rooms (7%).

Only barriers to this intervention were reported, most frequently related to resource constraints, such as: lack of scanners or lack of space; information technology issues; insufficient staffing, particularly pharmacists; or workflow issues such as one-step prescribing and administration and lack of electronic order entry. Some of the barriers were related to specific outpatient locations, such as concerns about sterility and inaccessible patients' identification bands in the operating room, and concerns about metal objects and the absence of barcodes on radiopharmaceuticals in radiology. Because no enablers for expanding barcode technology in limited-stay locations were provided

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This is not the first time such a mix-up has been reported with AuroMedics products. Many of their injectable products packaged in clear glass vials have the same blue and white label colors and blue caps. The company uses various geometric shapes on the primary display panel (**Figure 1**, page 1) to help differentiate the products. This label design strategy does not appear to be effective given a long history of error reports sent to ISMP for these products. For example, we have previously reported a mix-up between pantoprazole and bupivacaine vials from AuroMedics (www.ismp.org/node/31450). Administering bupivacaine IV instead of pantoprazole could prove fatal.

We have reported this concern, with recommended labeling changes, to the US Food and Drug Administration (FDA) and the manufacturer. Please review which products you purchase from AuroMedics and consider purchasing some from a different manufacturer to better distinguish between the products' appearance.

**Strategies for the ExactaMix valve set shortage.** As mentioned in our last newsletter, Baxter has notified its customers about a supply disruption of the ExactaMix Automated Compounding Device valve sets (1200 Valve Set H938792 and 2400 Valve Set H938724) due to raw material constraints. To assist with conservation and mitigation strategies, ISMP has collaborated with the American Society for Parenteral and Enteral Nutrition (ASPEN), the American Society for Health-System Pharmacists (ASHP), and the National Home Infusion Association (NHIA) to offer potential approaches for managing this supply disruption, which can be found at: www.ismp.org/ext/896. Please review and share this document.

**Topical gel dispensed in an ENFit syringe given via G-tube.** A chronic pain service provider prescribed a topical gel containing amitriptyline 1% and ketamine 1% for an inpatient with a gastrostomy tube (G-tube). The pharmacy-compounded gel (1 mL) was packaged in ENFit syringes, which were labeled with the ingredients and topical route of administration. While administering several oral liquid medications packaged in ENFit syringes via the patient's G-tube, a nurse accidentally

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by survey respondents, ISMP is collaborating with a health system to describe how they achieved full implementation of this technology in their operating and procedure rooms. Look for this article to appear in this newsletter within the next few months.

The **second intervention** with *Best Practice* #18 recommends regularly reviewing barcode scanning compliance rates and other metrics (e.g., bypassed or acknowledged alerts) to assess the utilization and effectiveness of this safety technology. For hospitals that had partially or fully implemented barcode technology in various limited-stay locations, 69% reported full implementation and 31% reported partial implementation for reviewing compliance and alert data. However, a few respondents said they were unable to tell whether compliance data reflected scanning *before* or *after* drug administration.

## New *Best Practice* 19 Safe Use of High-Alert Medications

New *Best Practice* #19 consists of six interventions to improve the safe use of high-alert medications by layering strategies throughout the medication-use process. Very few hospitals reported no implementation of these interventions. Additionally, some respondents noted that the California (CA) Medication Error Reduction Plan (MERP) (www.ismp.org/node/806) mandates some of the specific interventions associated with *Best Practice* #19.

The **first intervention** recommends creating a robust set of processes for managing risk for each medication on the facility's high-alert medication list, impacting as many steps of the medication-use process as feasible. Sixty-four percent of hospitals reported full implementation and 35% reported partial implementation. Full implementation was greatest in large hospitals with 500 beds or more (77%) and lowest in mid-sized hospitals with 100 to 499 beds (57%). Numerous respondents noted that this was a time-consuming process, making it difficult to assess each drug on their high-alert medication list. Others reported that they had completed the task by prioritizing their list and addressing the highest priority drugs first. Several respondents said it was helpful to post guidance on managing the risks of high-alert medications in an accessible electronic format.

The **second intervention** recommends addressing system vulnerabilities at each stage of the medication-use process and ensuring that the strategies apply to prescribers, pharmacists, nurses, and other practitioners involved in the medication-use process. Sixty-three percent of hospitals reported full implementation and 36% reported partial implementation. Survey respondents reported that some phases of the medication-use process were easy to overlook if internal errors had not occurred in these phases.

The **third intervention** recommends the avoidance of relying only on low-leverage risk-reduction strategies (e.g., providing education) to prevent errors, and instead, bundling these with mid- and high-leverage strategies (www.ismp.org/node/18343). Hospitals were split between full (51%) and partial (49%) implementation. Full implementation was greatest in large hospitals with 500 beds or more (76%) and in hospitals with an MSO (60%). Only 27% of hospitals without an MSO reported full implementation. Respondents only reported barriers to implementation, including medication technology costs and limitations, and lack of leadership support. A few respondents also noted their overreliance on high-alert medication labels, a low-leverage strategy.

The **fourth intervention** recommends limiting the use of independent double checks to select high-alert medications with the greatest risk for error within the organization. Sixty-six percent of hospitals reported full implementation and 31% reported partial implementation. Full implementation was greatest in mid-sized hospitals (76%). Only 47% of large hospitals with 500 beds or more reported full implementation. Respondents reported several barriers to limiting the use of independent double checks, including pediatric medication safety requirements and the need to standardize practices within a health system. Several respondents thought that electronically controlling the completion and documentation of independent double checks best enabled them to limit their use.

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administered the topical gel that way, too. The topical gel was scheduled for application at the same time as the enteral liquid medications. Fortunately, there were no systemic effects from the drug, and the patient was not harmed.

Although it may not be considered "unit dose," it would be safer to package compounded topicals in available tubes or jars. Yet, packaging topical products in oral syringes appears to be a common practice at many hospitals, compounding pharmacies, and outsourcers. After conversion to ENFit, oral syringes may no longer be available since ENFit syringes can be used in place of oral syringes. Such was the case at the hospital that reported this error.

The hospital is now exploring unit dose blisters that are typically used for repackaged solid oral dosage forms for packaging and dispensing of low-volume topical ointments and gels. Still, whenever a substance meant for one route is placed in packaging meant for another route, the chance of administering the medication by the wrong route is increased. For example, we have previously reported errors related to accidental injection of topical thrombin that was placed in a parenteral syringe (www.ismp.org/node/234).

Topical medications should never be placed in a parenteral syringe, since the consequences of administering a topical medication by a parenteral route could be devastating. The primary strategy for preventing this type of error is to package a topical medication in a container that practitioners would expect, such as tubes or jars. But if your hospital must use an ENFit or oral syringe to package a topical product, affix a prominent auxiliary label stating, "For External Use Only," over the syringe cap (**Figure 1**), as well as on the immediate container to

**Figure 1.** If you must package a topical product in an enteral or oral syringe, affix an auxiliary label stating, "For External Use Only," over the cap and to the immediate container.

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**Table 1.** Compliance with three new 2022-2023 ***ISMP Targeted Medication Safety Best Practices for Hospitals*** (N = 188)

| Best Practice* | Percent Compliance | | | Commonly Reported Barriers (B) and Enablers (E) to Implementation |
|---|---|---|---|---|
| | None | Partial | Full | |
| **#17. Safeguard against errors with oxytocin use** | | | | |
| Require the use of standard order sets when prescribing | 5 | 12 | 83 | **B:** Anesthesia staff resistance; allowing prescribers to bypass the order set<br>**E:** Implement systemwide standard order sets; leadership requiring its use |
| Standardize to a single concentration for both antepartum and postpartum infusions | 7 | 9 | 84 | **B:** Anesthesia staff resistance; supply issues<br>**E:** Provide a single concentration in the electronic prescribing system and infusion pump drug library |
| Standardize how oxytocin doses, concentration, and rates are expressed | 4 | 16 | 80 | **B:** Different dose expressions based on the indication<br>**E:** Standardize dose expressions in order sets and infusion pump drug library |
| Communicate infusion orders in terms of the dose rate and align with the smart infusion pump dose error-reduction system (DERS) | 5 | 13 | 82 | **B:** Workflow challenges; oxytocin excluded from infusion pump interoperability<br>**E:** Review oxytocin dose rates monthly at medication safety meetings |
| Provide oxytocin in a ready-to-use form | 5 | 9 | 86 | **B:** May not be available commercially; supply issues<br>**E:** Pharmacy prepares infusions; purchases infusions from a compounder |
| Boldly label both sides of the infusion bag to differentiate oxytocin bags from plain hydration and magnesium infusions | 49 | 15 | 36 | **B:** Infusions purchased from a compounder are only labeled on one side<br>**E:** None reported |
| Avoid bringing oxytocin to the bedside until it is prescribed and needed | 7 | 36 | 57 | **B:** Staffing shortages; nurse preference to have all emergency supplies in room; nurse unable to leave patient alone to get supplies<br>**E:** None reported |
| **#18. Expand the use of barcode verification prior to medication and vaccine administration beyond inpatient care areas** | | | | |
| Target areas with a short or limited patient stay, such as: | | | | |
| a. Emergency department | 7 | 28 | 65 | **B: Equipment related** - Not enough scanning equipment; lack of space for equipment; concerns about sterility or metal objects<br>**B: Information technology related** - Requires complex rebuilding of the electronic health record; problems with electronic prescribing templates<br>**B: Staffing related** - Not enough pharmacists to verify orders; training needs, especially with contracted per diem nurses; misperception that scanning is only needed for documentation; perceived increase in time; low compliance<br>**B: Workflow related** - One-step medication prescribing, administration, documentation (no order entry); verbal orders; medications not prepared and barcoded in the pharmacy; patient's identification band under a sterile drape; lack of barcodes on some drugs such as radiopharmaceuticals; medication/solution (e.g., dialysate) not documented on the medication administration record<br>**E:** None reported |
| b. Operating rooms (ORs) | 38 | 55 | 7 | |
| c. Procedure rooms | 24 | 60 | 16 | |
| d. Perioperative holding areas | 13 | 24 | 63 | |
| e. Post-anesthesia care units (PACU) | 9 | 18 | 73 | |
| f. Radiology | 28 | 41 | 31 | |
| g. Labor and delivery | 5 | 23 | 72 | |
| h. Infusion clinics | 16 | 8 | 76 | |
| i. Dialysis centers | 11 | 22 | 67 | |
| j. Cardiac catheterization labs | 31 | 46 | 23 | |
| Regularly review compliance data and other metrics to assess utilization and effectiveness | 0 | 31 | 69 | **B:** Unable to tell if compliance statistics reflect scanning *before* (appropriate) or *after* (inappropriate) drug administration<br>**E:** None reported |
| **#19. Layer numerous strategies throughout the medication-use process to improve the safety with high-alert medications** | | | | |
| For each high-alert drug on the facility's list, outline a robust set of processes for managing risk, impacting as many steps of the medication-use process as possible | 1 | 35 | 64 | **B:** Difficult to assess all aspects for each drug; lack of time<br>**E:** Put guidance in an electronic format; address certain medications that have the highest risks to patients first |
| Ensure that the strategies address vulnerabilities in each stage of the medication-use process and apply to all involved disciplines | 1 | 36 | 63 | **B:** Easy to overlook some phases of medication-use process<br>**E:** Required element in the California (CA) Medication Error Reduction Plan (MERP) |
| Avoid reliance on low-leverage strategies to prevent errors, and instead bundle these with mid- and high-leverage strategies | 0 | 49 | 51 | **B:** Cost; technology limitations; high-leverage strategies not a leadership priority; overreliance on high-alert medication stickers<br>**E:** None reported |
| Limit the use of independent double checks to select high-alert medications with the greatest risk for error | 3 | 31 | 66 | **B:** Standardization within health systems; pediatric safety requirements<br>**E:** Electronically controlling a few key independent double checks |
| Regularly assess for risk in safety systems and practices by using information from internal and external sources | 0 | 31 | 69 | **B:** None reported<br>**E:** Required element in the CA MERP; schedule time to review internal and external information and make the review a standing agenda item |
| Establish outcome and process measures to monitor safety and routinely collect data to determine the effectiveness of strategies | 6 | 53 | 41 | **B:** Overreliance on voluntary reporting<br>**E:** Required element in the CA MERP |

* For a full description and the exact wording of each *Best Practice,* please visit: www.ismp.org/node/160.

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The **fifth intervention** recommends regularly assessing for risk by using information from internal and external sources. More than two-thirds (69%) of hospitals reported full implementation, and the remaining hospitals (31%) reported partial implementation. Full implementation was greatest for large hospitals with 500 beds or more (81%) and in hospitals with an MSO (74%). Only 56% of small hospitals with fewer than 100 beds and 59% of hospitals without an MSO reported full implementation. Only enablers to implementation were provided by respondents, including scheduling the review of both internal and external information at medication safety meetings, making the review a standing agenda item, and listing various reputable sources of external information, including the ISMP quarterly ***Action Agenda*** (www.ismp.org/node/645) and ***National Alert Network*** (NAN) alerts (www.ismp.org/node/14).

The **sixth intervention** recommends establishing outcome and process measures to monitor medication safety and routinely collecting data to determine the effectiveness of risk-reduction strategies. This intervention had the lowest rate of implementation for *Best Practice* #19, with only 41% reporting full implementation, 53% reporting partial implementation, and 6% reporting no implementation. Full implementation was greatest in hospitals with an MSO (45%) when compared to hospitals without an MSO (27%). The most frequent barrier to full implementation was an overreliance on internal voluntary reporting systems to assess and monitor medication safety.

## Conclusion

These survey results suggest there is room for improvement with the three new *Best Practices.* We hope that hospitals use the survey results to prompt interdisciplinary discussions and take note of the barriers and enablers to implementation of these *Best Practices.* An *Implementation Worksheet* (www.ismp.org/node/1506) for all of the *Best Practices* is available and might be helpful to document your assessment of implementation status, actions required, and assignments.

## New ECRI and ISMP Headquarters

On April 19, 2022, ECRI and ISMP celebrated the opening of a new state-of-the-art global headquarters and medical device evaluation laboratory on a 24-acre campus near Philadelphia, PA. In 2020, ISMP became an affiliate of ECRI and together created the largest healthcare quality and safety entity in the world, driving greater value to healthcare across all care settings. The opening of the new building marks an historic opportunity for the nation's largest patient safety organization (PSO) to fulfill its mission and to usher in a new era of patient safety innovation.

With the opening of the new headquarters, ISMP's old office has closed. Our new address is 5200 Butler Pike, Plymouth Meeting, PA 19462. However, our telephone number remains the same: 215-947-7797. Of course, you can always reach us by email (ismpinfo@ismp.org) and via the Contact Us page (www.ismp.org/contact) on our website.


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cover any incorrect route-specific instructions. (Some syringes state, "For enteral use" or "For oral use," which would communicate the wrong route.) Pharmacy should track patients with feeding tubes (which will soon all be ENFit). When possible, avoid scheduling topical medications packaged in an oral or ENFit syringe at the same time oral or enteral drugs are administered.

## Special Announcement

### Updated ISMP guidelines for sterile compounding

ISMP has revised and released its updated 2022 ***Guidelines for Sterile Compounding and the Safe Use of Sterile Compounding Technology.*** An invitational, multi-stakeholder, virtual sterile compounding safety summit was held last fall to address safe practices related to the use of sterile compounding workflow management systems, automated compounding devices, and robotic compounding automation. The summit informed the updated guidelines, a draft of which was distributed first for public comment.

The updated guidelines focus on essential technology attributes and best practices for sterile compounding processes, including when technology cannot be used. Each section of the guidelines includes a table listing common safety gaps and the associated best practices. To access the updated guidelines, please visit our website at: www.ismp.org/node/31362.



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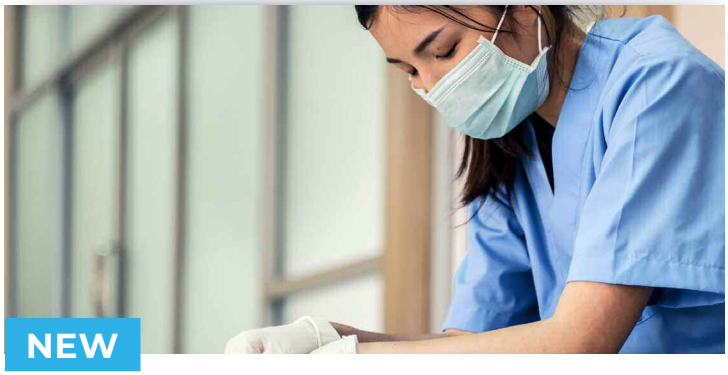
**Report medication and vaccine errors to ISMP:** Call 1-800-FAIL-SAF(E) or visit our website at: www.ismp.org/report-medication-error. ISMP guarantees the confidentiality of information received and respects the reporters' wishes regarding the level of detail included in publications.

SPRING 2022

# ISMP Resources and Services



NEW

## Responding to Fatal Events

ISMP has posted resources for healthcare organizations considering their response to the conviction of a former registered nurse following a fatal error. The list provides links to information on Just Culture as well as preventing errors with neuromuscular blocking agents.

**ismp.org/node/31006**

REPORT

## Please Report Errors

The stories you share with us of actual errors and hazardous conditions make all the difference. Providing ISMP with details about medication and vaccine errors helps identify causes and protect patients from similar mistakes in the future.

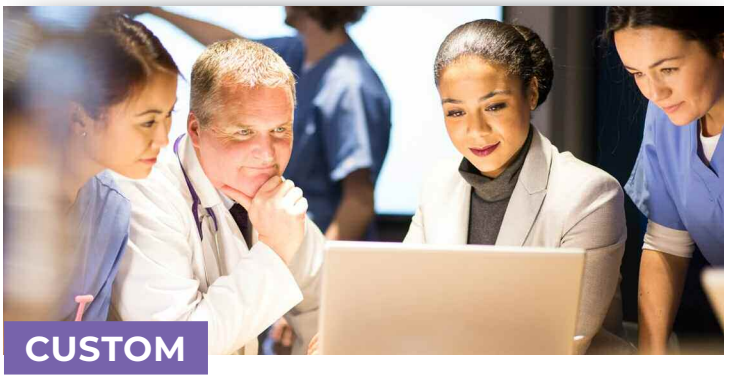
**ismp.org/node/18107**

DON'T MISS

## Attend a MSI Workshop

Space is filling fast for ISMP's virtual ***Medication Safety Intensive (MSI)*** workshops in June, August, and October. Register now and learn how to maximize your error prevention efforts!

**ismp.org/node/127**



CUSTOM

## Get a Safety Checkup

Are you considering implementing a new medication safety initiative or want to quickly address a specific challenge? ISMP offers a one-day customized ***Medication Safety Checkup™*** virtually or in person that can help your organization make more informed decisions about next steps.

**ismp.org/node/23546**

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Register for our free **May 6, 2022**, webinar on human fallibility, system design, and justice:

**ismp.org/node/31106**