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ISMP An ECRI Affiliate

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

# The role of simulation when onboarding healthcare professionals—Part II

**Problem:** Simulation is an evidence-based teaching method that can help facilitate the learning of important safety and quality aspects of patient care by replicating a process or system in a safe environment to gain insight (www.ismp.org/ext/1125). While learning from mistakes is an important part of new hire orientation, involving a patient might risk safety. Even while shadowing seasoned staff, there will never be sufficient opportunity to experience all the complex situations that new hires will eventually face. New practitioners may not be able to observe error-prone scenarios or practice critical tasks under the guidance of a mentor if the critical tasks do not happen during their orientation. It is also likely that situations will be missed in which patients present with rare diseases and corresponding medication therapy.

Current staffing levels and high patient acuity may not allow for an adequate amount of time dedicated to teach new hires and they may be pressured into uncomfortable situations before they are ready. So, during onboarding, how can we add to the new hire's knowledge so they can apply it to clinical practice? Furthermore, how can we best use mistakes that were made in the hospital and from external sources to show new practitioners how they can learn from them? In **Part I**, we presented how to promote a safety culture during the onboarding process. In **Part II**, we discuss the role of simulations in new hires' medication safety education.

## Understanding Simulation

Simulation has been used in many industries such as aviation, spaceflight, nuclear power, shipping, military, and sports (www.ismp.org/ext/1125). These industries are often held up as examples when it comes to risk mitigation and safety. Simulation in healthcare can be used to prepare staff to properly perform certain tasks or processes, utilize critical job-specific tools/devices (e.g., infusion pumps, automated dispensing cabinets [ADCs], compounding technology), or identify and troubleshoot failure modes (e.g., dose error, technology downtime). ISMP has advocated for the use of simulation for certain scenarios highlighted in the following articles: *Survey results from pharmacists provide support to enhance the organizational response to codes* (www.ismp.org/node/41947); *Emergency preparedness: Be ready for unanticipated electronic health record (EHR) downtime* (www.ismp.org/node/34220); *Are you well positioned to resolve conflicts with the safety of an order? Learning from a physician's homicide trial and the firing of multiple healthcare workers* (www.ismp.org/node/31756); and *Prevent uncontrolled, rapid infusion rates: Confirm infusions are connected to pumps before opening the clamp!* (www.ismp.org/node/33246).

## Simulation as Part of Healthcare Education

*The National Council of State Boards of Nursing (NCSBN) National Simulation Study: A Longitudinal, Randomized, Controlled Study Replacing Clinical Hours with Simulation in Prelicensure Nursing Education* (www.ismp.org/ext/1126) assessed the impact of simulation on educational outcomes in student practitioners. New nursing students were randomized into three groups: a traditional clinical program (control), and students who had either 25% or 50% of their clinical hours replaced by simulation. The students remained in their group for all core clinical courses in their program and were followed for 6 months after graduation, during their first position as a registered nurse (RN). They found that substituting up to 50% of traditional

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## SAFETY briefs

HIGH-ALERT

**The Joint Commission takes a step backward.** In December 2022, The Joint Commission (TJC) released a prepublication document (www.ismp.org/ext/1147) announcing their intention to retire a long list of accreditation requirements, also known as elements of performance (EPs), on February 19, 2023. We were stunned to learn that among the EPs marked for retirement were long-standing national patient and medication safety priorities that originated from actual tragic errors reported by hospitals. Careful consideration had been given to the development of reasonable, practical, and effective prevention strategies to limit risk and prevent serious patient harm. As priorities, they have given hospitals a way to proactively use the lessons learned from other hospitals and health systems to prevent harmful and sometimes fatal medication errors. We are particularly concerned with the retirement of the two EPs listed below:

- **The hospital keeps concentrated electrolytes present in patient care areas only when patient safety necessitates their immediate use, and precautions are used to prevent inadvertent administration** (TJC MM.03.01.01, EP 9).

In particular, when stocked on nursing units, vials of concentrated potassium injections such as potassium chloride and potassium phosphate, have sometimes been erroneously drawn up and injected without dilution resulting in adult and child deaths. Limiting access to these products was one of the most important and successful high-leverage strategies undertaken during the late 1990s. In fact, the premiere edition of the TJC *Sentinel Event Alert* addressed fatal events involving potassium chloride for injection concentrate, suggesting its removal from floor stock. While we continue to learn of fatalities that happen outside the United

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clinical experience with high-quality simulation produced comparable educational outcomes in core nursing courses.

In another study by Advocate Aurora Health, a medication safety "escape room" was used as part of a training module for pharmacists and pharmacy technicians.[1] The escape room included concepts of barcode scanning, look- and sound-alike medications, high-alert medications, and calculations. This allowed for errors to be simulated in a controlled environment to increase medication safety knowledge. Participants reported that the simulation was more engaging than the alternative online self-paced learning modules, as they were communicating with colleagues to escape each room.

What is missing in healthcare practitioner educational programs is a bridge between classroom learning and real-life clinical experience. Simulation can provide such a bridge and protect students from work-related dangers (e.g., infected needles, blades, electrical equipment). Educators can also use simulation to emphasize realistic situations by putting more stress and pressure on practitioners to perform a task. For example, rather than reading about how to administer an injection, new practitioners can practice preparing and administering a vaccine by drawing it up from a demonstration vial using a needle and syringe and injecting into an orange or foam pad. Using simulation to enhance learning can also be used to ensure competency. Consider the difference between requiring a surgeon to pass a written multiple-choice exam on how to perform laparoscopic surgery and having them demonstrate the use of the actual technology in a simulated environment.

**Safe Practice Recommendations:** Knowing that every organization has limited resources, consider the following recommendations when formalizing or incorporating medication safety simulation into your educational programs:

**Start with what you have.** The healthcare educator who oversees new practitioner onboarding should identify what simulations are already being performed but are not distinguished as a "simulation" (e.g., sterile compounding, programming smart infusion pumps, patient counseling, emergency downtime drills) and incorporate it into a formalized simulation process.

**Expand content.** Develop simulation videos for staff that involve the identification of medication errors (e.g., sterile compounding with errors in technique, overriding an alert in the dose error-reduction system [DERS] when programming a smart pump). In our June 1, 2006 newsletter, we wrote about creating a "room of horrors" with a simulated patient and chart, set up with common items and mistakes that can lead to patient harm. Consider developing simulations to address actual errors that have occurred in your facility or those that have appeared in the ***ISMP Medication Safety Alert!*** Consider including the following errors or hazards as simulation scenarios: selecting the incorrect patient profile in the EHR or ADC, not reading back a verbal order, confusing look-alike medication packaging, preparing an oral medication in a parenteral syringe, administering the wrong medication using an unlabeled syringe, or a misconnection due to not tracing an infusion line before connecting it to the patient.

**Use simulation to ensure competency.** Develop simulation programs to ensure competency when new staff perform essential medication-related tasks. Provide ongoing simulation opportunities when introducing new procedures or improving how infrequent tasks should be accomplished. The healthcare educator should repeat the simulation with different variables until the learner has become skilled. Once this is mastered, incorporate additional elements such as noise, distractions, and interruptions to better replicate a realistic work environment. Simulated distractions can make staff aware of the impact these can have on their processes. In one school of nursing where students participated in simulations with varied background noises (e.g., music, conversations) and noise levels, the students found that distractions decreased accuracy in medication preparation and administration and led them to take additional time to check their calculations.[2]

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States, ISMP is unaware of a single fatality where a vial of potassium concentrate injection was taken from floor stock in error in a TJC-accredited hospital since the EP was put into place. However, we are aware of a death that occurred after the drug was dispensed by pharmacy (www.ismp.org/node/25027).

- **When heparin is administered intravenously and continuously, the hospital uses programmable pumps in order to provide consistent and accurate dosing** (TJC NPSG.03.05.01, EP 8).

A heparin infusion, one of the most frequently used high-alert medication infusions, needs to be carefully controlled by a smart infusion pump with a drug library and dose error-reduction system. Heparin dose- and rate-setting errors and gravity flow incidents have led to overdoses and bleeding events.

We fear that retirement of these requirements will send a message that these lifesaving practices are no longer important or are just "nice to do, but not required." Then, slowly, over time, the practices will be relaxed at some hospitals, which will lead to predictable and unnecessary patient harm and even death.

We have shared our concerns with TJC and were told that the reason for the retirement of these requirements was that organizations have adopted them as standardized practices and they are compliant with the requirements. In addition, these EPs are covered by other broader but non-specific requirements. While these (and other) EPs may no longer be scored by TJC, this does not mean that hospitals and patients are no longer at risk—these practices are still important for patient safety. Do not let your guard down!

**Enfamil multivitamin labeling—easy to miss which product contains iron.** A pharmacy technician identified a look-alike labeling concern upon receiving a shipment of Enfamil **POLY-VI-SOL MULTIVITAMIN DROPS** (NDC: 00087-0402-03) and **POLY-VI-SOL MULTIVITAMIN & IRON DROPS**

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**Use simulation to validate new processes or technologies.** Use simulation to evaluate updates to technologies (e.g., prescribing using new order sets, pump library updates, new drugs or formulations in intravenous [IV] workflow management systems). You can also simulate new workflow processes to test what does and does not work, gain crucial feedback from frontline staff, and identify any potential safety gaps before rolling out large scale changes. Consider having "a day in the life" to run real-life simulations of new technologies/devices to see how they work in your clinical settings with your staff, compared to testing environments utilized by vendors.

**Collaborate with various disciplines.** Partner with other healthcare practitioners in medication safety simulations (e.g., code response, malignant hyperthermia, EHR downtime), and practice teamwork behavior (e.g., managing high workload, coordinating under stress, effective communication).

**Debrief.** After each simulation, incorporate a formal debriefing.[3] Provide a safe learning environment for staff to discuss what occurred during the simulation scenario. Explain any "missed" errors to the participant(s) and allow them to ask questions, share concerns, and review what could be improved upon to determine how to better approach future simulations and medication safety processes.

**Partner with colleges and universities.** All educational programs in healthcare-related professional schools should include a course on medication safety. Ideally, these courses should also incorporate simulations that include common unsafe medication-related processes, medication errors, and high-risk scenarios. Reach out to affiliated or local colleges/universities and ask about the use of simulations in the curriculum. Consider partnering with them to develop ways to strengthen these programs.

**References:**

1) Kasal T, Sabol K. Novel medication safety training module. *Am J Health Syst Pharm.* 2022;79(Suppl 4):S123–27.
2) Thomas CM, McIntosh CE, Allen R. Creating a distraction simulation for safe medication administration. *Clin Simul Nurs.* 2014;10(8):406-11.
3) Thomas Dreifuerst K. Getting started with debriefing for meaningful learning. *Clin Simul Nurs.* 2015;11(5):268-75.

# Survey results show implementing a medication error reduction plan (MERP) improves safety

ISMP and the California Society of Health-System Pharmacists (CSHP) would like to extend our sincere appreciation to the 226 respondents who completed our survey to better understand how the California Medication Error Reduction Plan (MERP) has impacted medication safety and what people in other states think of the concept. Most respondents were pharmacists (81%), followed by nurses (8%) and pharmacy technicians (8%). We also received responses from other disciplines (3%) including risk managers, hospital administrators, and others. More than half (52%) of the respondents work in states that do not require a MERP, and the remaining work in California (47%) or Arkansas (1%), which requires a MERP through the California Department of Public Health (CDPH) or the Arkansas State Board of Pharmacy, respectively.

**California and Arkansas Respondents.** More than half (57%) of respondents who work in California and Arkansas have a designated Medication Safety Officer (MSO) or similar position responsible for leading the coordination of their organization's MERP. Two out of three (66%) did not have an MSO or similar position prior to the MERP requirement, and more than half (52%) told us that the requirement helped justify this position within their organization. In addition, approximately half (51%) of the respondents reported that resources dedicated to medication safety have increased and almost two-thirds (63%) indicated that the requirement helped justify funding for implementing new technologies within their organization.

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(NDC: 00087-0405-01) manufactured by Mead Johnson & Company. The product containers are the same shape and size (50 mL), and the solutions are nearly the same color. After a

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**Figure 1.** The text denoting the formulation (i.e., with iron) remains small on the new Enfamil Poly-Vi-Sol Multivitamin & Iron Drops bottle (left) and Poly-Vi-Sol Multivitamin Drops bottle (right), while non-clinically relevant text has become prominent.


**Figure 2.** Primary display panels on cartons of Enfamil Poly-Vi-Sol Multivitamin & Iron Drops (top) and Poly-Vi-Sol Multivitamin Drops (bottom).

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Nearly three-quarters (72%) of respondents from California and Arkansas believed that patients in their organization are safer in part due to enforcement of the MERP's legal requirements and that this program has increased awareness of system changes that are needed to prevent medication errors (76%). Overwhelmingly, 84% of organizations use external medication-related error alerts to help identify systems and processes that need to be modified, a recommendation that ISMP has always advocated—taking certain aspects of another's experience and incorporating it into your own work for the purpose of improvement. In fact, 61% and 51% of respondents indicated that the MERP has increased the number of good catches/close calls and actual medication errors reported, respectively. Even more compelling is that 78% of survey respondents felt that their MERP has reduced harmful medication events. More than three-quarters (76%) of respondents from these two states said that outcomes from MERP initiatives have helped prioritize performance improvements within their medication management system.

We were pleased to see that most organizations (84%) reported that they use a Just Culture process when evaluating and discussing medication errors. Just Culture refers to a values-supportive system of shared accountability where organizations are accountable for the systems they have designed and for responding to the behaviors of their employees in a fair and just manner. Employees, in turn, are accountable for the quality of their choices and for reporting both their errors and system vulnerabilities.[1]

When asked to describe how enforcement of the MERP's legal requirements has advanced medication safety in their organization, respondents told us they observed more interdisciplinary collaboration and engagement by upper-level management in medication safety initiatives included in the MERP. To achieve regulatory compliance, the plan's effectiveness and outcomes receive considerable attention from leadership. One respondent shared that once it became a MERP goal, they were able to accomplish organizational goals that they had difficulty gaining traction on from just a departmental level. While some organizations were initially hesitant about meeting the essential elements of the MERP, respondents told us that the "weight of a regulatory requirement" ensures that the proper stakeholders participate in assessing trends and collaborating on solutions. The MERP program also provides "visibility, voice, and prioritization to medication systems and initiatives." It should be noted that some respondents shared that they would have a medication safety plan even if it was not mandated.

**Other States' Respondents.** We were also pleased to hear from those working in 30 other states that currently do not require a MERP. The majority (68%) of respondents were in favor of a regulatory requirement. Some (18%) did not think it should be mandated or expressed concern that a legal requirement could become overly burdensome. Others (14%) were unsure but hopeful it would be effective or were in favor of a voluntary organizational initiative to achieve a similar strategic medication safety plan. Many agreed that requiring a MERP would elevate current safety initiatives, allocate more resources dedicated to medication safety, and would have an overall positive impact on patient safety.

**Conclusion.** The MERP initiative provides a framework to advance many error-reduction strategies ISMP has advocated for over the years. The survey results support our recommendation for organizations to complete a gap analysis using the California MERP structure (www.ismp.org/node/46487) and to develop an impactful MERP that focuses on high-leverage systems and technologies. Similar to the California requirement, this comprehensive strategic plan should include a proactive approach to risk analysis, effective and timely use of measurable assessments to evaluate the impact of selective error-reduction strategies, and an annual review to assess the program's effectiveness. We also call for governmental organizations, accreditors, and regulatory agencies (e.g., state departments of health) to adopt initiatives similar to what California has established.

**Reference:**

1) Outcome Engenuity LLC (2012). Just culture: Training for managers.

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recent labeling design change, the formulation information remains small, and the non-clinically relevant text has become more prominent (**Figure 1**, page 3).

Similarly, the drug name and ingredients on the carton's primary display panels are much less prominent than the "Brain & Body" and "Growth & Immune Health" wording (**Figure 2**, page 3). Furthermore, both products lack a barcode on the immediate container label.

ISMP has contacted the manufacturer and asked them to better differentiate these products and to more prominently display the ingredient information. We have also notified the US Food and Drug Administration (FDA).

## Special Announcement

**FREE ASHP webinar**

Pharmacists and pharmacy technicians—the American Society of Health-System Pharmacists (ASHP) is offering a **FREE** one-hour program on **May 16, 2023** introducing the fundamental elements of implementation science. This webinar is the second in a series of three and will challenge learners to identify opportunities to apply strategies to improve adoption of standardized safety processes. Continuing education (CE) will be offered. For details and to register, visit: www.ismp.org/node/73960.



**Editors:** Michael Cohen, RPh, MS, ScD (hon), DPS (hon), FASHP; Shannon Bertagnoli, PharmD; Ann Shastay, MSN, RN, AOCN; Kelley Shultz, MD. ISMP, 5200 Butler Pike, Plymouth Meeting, PA 19462. Email: ismpinfo@ismp.org; Tel: 215-947-7797.