NCPD 1.5 ANCC CONTACT HOURS

VICTOR MOUSSA/SHUTTERSTOCK

Cause to Pause: Preventing medication errors with high-risk opioids

BY ELIZABETH H. SASSATELLI, PhD, RN

Abstract: Preventable medication errors cause nearly 9,000 deaths annually, though this number may be low due to underreporting. This article uses a case study to examine how the "cause to pause" safety strategy can help prevent medication errors.

Keywords: hydromorphone, medication error, morphine, opioid, patient safety

Preventable medication errors cause nearly 9,000 deaths annually in the US, making them the sixth leading cause of death.[1,2] Where death does not occur, hundreds of thousands of individuals every year fail to recognize that a medication error has occurred or do not report these events for fear of retaliation.[1] Medication errors may result in fatal outcomes for patients and severe emotional distress for healthcare providers. Medication errors place a large financial burden on the healthcare system, costing approximately $4 billion each year.[3] Medication errors are typically not the fault of only one person and can occur during any phase of the medication administration process (prescribing, transcribing/verifying, preparing, administering, and monitoring).[4] Nearly 60% of practicing nurses admit to having made at least one medication error in their career.[5,6] While safe medication delivery is a

shared responsibility between the nursing staff, the prescriber, and the hospital, nurses must be hypervigilant during medication administration since they are most often the last line of defense for the patient.

If something does not seem right, nurses should consider the "cause to pause" strategy, which aims to reduce medication errors and promote patient safety by improving the critical thinking skills of novice nurses. The "cause to pause" construct builds upon nursing intuition by initiating a standardized process for clinical decision-making when the clinician identifies a patient safety concern. Developed by the author in 2019 and incorporated into the undergraduate nursing curriculum at The University of Tampa, the "cause to pause" strategy includes the following steps: (1) stop what you are doing; (2) eliminate distractions; (3) think clearly; (4) consult with organizational resources to ensure compliance with the standard of care; and (5) proceed with caution.

This article discusses a case study that demonstrates how utilizing "cause to pause" could have prevented a medication error that resulted in the death of a patient.

Case background

This case study involves the administration of hydromorphone (Dilaudid). Hydromorphone is a pure opioid agonist with the principal therapeutic activity of analgesia and a Schedule II Controlled Substance similar to morphine but with an estimated 5 to 10 times more potent analgesic effect.[7] In addition, hydromorphone has a more rapid onset and shorter duration of action compared with morphine.[7] While doses vary among patients, a typical prescription for hydromorphone could be expected to range from 0.5 mg to 1.5 mg every 3-4 hours slow I.V. push as needed.[8] Occasionally, hydromorphone is dosed at 2 mg every 3-4 hours I.V. push as needed for patients who are opioid-tolerant and have not achieved successful pain relief from lower doses.[8] Nurses assess a patient's vital signs including peripheral blood oxygen saturation (SpO_2) before and periodically following the administration of hydromorphone. Even though nurses are educated on the dangers of "look-alike" and "sound-alike" drugs, confusion between hydromorphone and morphine continues to lead to medication errors.[8]

Nurses must be hypervigilant during medication administration since they are most often the last line of defense for the patient.

Facts of the case

MP was a 47-year-old female admitted to a local community hospital for an elective small bowel resection. She was married with five children under 10 years old. MP had a history of anxiety and childhood asthma. Her home medications included a multivitamin and ibuprofen for pain as needed. Her vital signs on admission to the hospital were: temperature, 97.8° F (36.6° C); heart rate, 92 beats/minute; respiratory rate, 20 breaths/minute; BP, 138/78; and SpO2, 98% on 2 L/minute supplemental oxygen via nasal cannula. MP's surgery lasted approximately 3 hours and was performed under general anesthesia. There were no interoperative surgical complications according to the medical records.

MP was transferred to the PACU at 1210 with prescriptions for hydromorphone 0.5 mg I.V. every 10 minutes as needed. While in the PACU, MP received six separate doses of I.V. hydromorphone between 1220 and 1415. She tolerated the hydromorphone without any signs of respiratory or cardiac compromise. At 1500, the nursing report was called to the general care unit. At 1516, MP was transferred to the general care unit in stable condition via stretcher. No cardiac or respiratory monitoring was ordered by the surgeon.

Upon arrival in the general care unit, MP's vital signs were: 97.6° F (36.4° C); heart rate, 77 beats/minute; respiratory rate, 16 breaths/minute; BP, 127/66; and SpO2, 96% on 2L. Her postoperative orders included: vital signs every 4 hours and as needed; I.V. Ringer's lactate at 125 mL/h; and oxycodone-acetaminophen 5-325 (Percocet and others), 1-2 tablets every 4 hours as needed for pain.

At 1600, MP's vital signs were: 97.6° F (36.4° C); heart rate, 76 beats/minute; respiratory rate, 18 breaths/minute; BP, 127/62; and SpO2, 98% on 2L. MP complained of 8/0-10 incisional pain. At 1603, the nurse administered oxycodone-acetaminophen 5-325 two tablets. At 1615, MP complained of nausea. The nurse administered the antiemetic and histamine 1 antagonist, promethazine (Phenergan) 25 mg I.V. x 1 as prescribed (Safety issue #1: Per the Institute of Safe Medication Practices [ISMP], intravenous promethazine is now considered an unsafe medication and should

no longer be prescribed or administered[9]). At 1630, MP began to complain of increased pain that was not controlled by the oxycodone-acetaminophen 5-325 that was previously given. The nurse obtained prescriptions from the surgeon for hydromorphone 4 mg I.V. push every hour as needed for pain (Safety Issue #2: Medication dose too high for this opioid-naive patient[8]). Between 1630 and 0106, MP received a total of 12 mg of I.V. push hydromorphone (Safety Issue #3: Frequent high-risk medication being given to the patient without proper monitoring[8]). During this time, the nurse obtained only two sets of vital signs, none of which included SpO2 (Safety Issue #4: Inadequate patient monitoring[8]). The physical assessments performed by the nurse were done from the doorway of the patient's room and the patient was noted to be "sleeping" and "in no distress" (continued inadequate patient monitoring). At 0550, the nurse entered MP's room to find her unresponsive, apneic, and pulseless. A code blue was called and basic life support and advanced cardiovascular life support were initiated. Despite aggressive measures, return of spontaneous circulation was not achieved. MP was pronounced deceased at 0625.

Searching for answers

Hospitals must thoroughly evaluate their processes so that situations like MP's do not occur. In general, these events are the result of antiquated processes, limited resources, inadequate education, and at-risk behaviors of clinicians.[10,11] According to the ISMP, most human errors can be classified as either execution failures (skill-based mistakes) or planning failures (knowledge-based mistakes).[10] In the case of MP, planning failures and multiple exogenous (system-based) errors occurred. [10]

Most human errors can be classified as either execution failures (skill-based mistakes) or planning failures (knowledge-based mistakes).[10]

Following MP's unexpected and tragic death, her family began looking for an explanation as to how such a tragedy could occur in an otherwise healthy 47-year-old woman. Her family filed a lawsuit against the hospital, the nurses in the general care unit, and the surgeon who cared for MP. A review of the evidence revealed that the hospital had five policies in place to reduce the likelihood of medication errors. These policies were related to the following: (1) safe medication administration; (2) administration of high-risk medications; (3) management of look-alike or sound-alike medications; (4) monitoring the effects of medications; and (5) communication to the physician or provider. Unfortunately, these policies were not clearly written nor readily available to the nurses and the surgeon. In MP's case, the nurse failed to follow each policy and, in most cases, did not even know that the policies existed. At her deposition, the general care nurse acknowledged that the doses of hydromorphone she administered were "high." At no time did the nurse question the surgeon's order. In addition, both the nurse and the surgeon testified that they were not aware of the potency of hydromorphone compared with that of morphine. The nurse also testified that on the shift in question, the general care unit had less than the desired number of licensed staff and that all of the RNs on duty had less than 5 years of clinical experience. Lack of clinical experience was also noted among the pharmacy staff on duty during the incidence. The surgeon testified under oath that he was not aware of the dose of hydromorphone that the patient had received in the PACU nor how much of the drug MP had already received prior to his prescription for 4 mg every hour as needed. The surgeon further stated that he was not informed by the nurse nor the automated prompt during order entry that the patient was opioid-naive. The nurse and the surgeon both acknowledged that the vital signs were not discussed during their brief telephone call. Neither the nurse, the surgeon, nor the pharmacist recognized the possible dangers of administering 4 mg of I.V. push hydromorphone hourly to an opioid-naive patient in a general care unit without cardiac monitoring, capnography (the gold standard for hydromorphone safety monitoring), or continuous pulse oximetry.[7,8]

The outcomes of this case included the admission of various violations in the standard of care by the nurse, the surgeon, the pharmacist, and the hospital itself. No license discipline was instituted. The nurse who delivered care to MP in the general care unit reported severe anxiety, difficulty concentrating, extreme sadness, and thoughts of leaving the profession. The emotional impact on the surgeon and the registered pharmacist is unknown. A confidential pre-trial

settlement was awarded to the surviving family.

Implications for nursing practice

Nurses administer on average more than 50 medications every shift and spend nearly 40% of their work time on medication administration.[2] The standards of care for nursing require that the nurse administer medications in a safe manner consistent with the prescription authored by the surgeon or other licensed independent provider. To ensure medication safety, nurses must be familiar with four critical concepts: the six rights of medication administration, high-alert medications, look-alike and sound-alike medications, and opioid naivety. A lack of knowledge of any of these four critical concepts may lead to a breach of the fourth step of the "cause to pause" strategy (ensuring compliance with the standard of care).

The six rights of medication administration outline a fundamental framework for nursing practice, which states that before administering any medication, the nurse must ensure the right patient, medication, dose, route, time, and documentation. An error in any of these rights could harm a patient. According to the ISMP, nurses must be familiar with medications that are deemed "high alert." These medications should have standardized mechanisms for how they are prescribed, stored, prepared, and administered. Access to "high-alert" medications should be limited to those care providers who have the skills and education required to safely prepare and administer them. Electronic ordering and dispensing protocols should include automated safety alerts whenever these medications are utilized. In addition, nurses must be acutely aware of any medications in their practice area with names that sound the same or labels that look similar. Finally, nurses must be mindful of patients who are opioid-naive, defined as those who have not received opioids within 30 days prior to an acute event or surgery. Patients who are opioid-naive are at increased risk for oversedation, respiratory suppression, and respiratory arrest. [10]

Anxiety, stress, physical and emotional distractions, fatigue, poor staffing patterns, technology glitches, and a lack of safety protections such as barcoding increase the likelihood of medication errors.

Nurses must also learn why medication errors occur and how to prevent these errors.[11] They must understand that while errors do happen, they are often multifactorial. Anxiety, stress, physical and emotional distractions, fatigue, poor staffing patterns, technology glitches, and a lack of safety protections such as barcoding increase the likelihood of medication errors. Other potential issues that should be examined include confirmation bias (seeing what you believe), change blindness (inability to detect changes in plain view), inattention blindness (inability to see information because you are focused on something else), and normalcy bias (thinking you will never make severe mistakes). [11]

Nurse managers should not wait until medication errors occur to have critical conversations with their staff.[11] Nurse managers can practice daily coaching to assist the staff in reflecting on their behavioral choices and clinical decisions. These conversations can raise awareness of the knowledge deficits and hazards associated with high-risk behaviors. Research shows that many individuals who demonstrate at-risk behaviors do so due to a lack of understanding of the threats to patient safety that result from their actions as opposed to inadequate knowledge about a particular task or intervention.[11] Once nurse managers ensure that the staff is comfortable with receiving coaching on their behavior, they can also promote peer-to-peer coaching to encourage individuals to modify risky behaviors and improve patient safety.[11]

Hospital administrators also play a key role in reducing medication errors. They must help create safe environments where medication errors are reduced through automation, standardization, proper resource allocation, and simplification of processes. This can be done prospectively by performing failure modes and effects analysis, which is a systematic and proactive method for evaluating a process to identify potential problems, or retrospectively using root cause analysis techniques.[11]

Although additional research is needed to formally validate the "cause to pause" strategy, it can be utilized to assist nurses in carefully examining all factors that can impact patient safety during medication administration. Bold steps are needed to further address the causes of preventable medication errors, particularly in light of the criminalization of medical errors.

Noting the inherent complexity and risks associated with medication administration, nurses should

consider using the "cause to pause" strategy to help reduce the likelihood of harm and ensure patient safety. ■

REFERENCES

1. Tariq RA, Vashisht R, Sinha A, Scherbak Y. Medication dispensing errors and prevention. In: *StatPearls*. Treasure Island, FL: StatPearls Publishing; 2021.

2. Salar A, Kiani F, Rezaee N. Preventing the medication errors in hospitals: a qualitative study. *Int J Afr Nurs Sci*. 2020;13:100235. doi:10.1016/j.ijans.2020.100235.

3. Bereta Vilela RP, de Carvalho Jericó M. Medication errors: management of the medication error indicator toward a more safety nursing practice. *J Nurs UFPE*. 2016;10(1):119-127.

4. Peterson V, Potter PA, Perry AG, Stockert PA, Hall A. *Clinical Companion for Fundamentals of Nursing: Just the Facts: With 106 Illustrations*. St. Louis, MO: Elsevier; 2017.

5. Krzan KD, Merandi J, Morvay S, Mirtallo J. Implementation of a "second victim" program in a pediatric hospital. *Am J Health Syst Pharm*. 2015;72(7):563-567. doi:10.2146/ajhp140650.

6. Cheragi MA, Manoocheri H, Mohammadnejad E, Ehsani SR. Types and causes of medication errors from nurse's viewpoint. *Iran J Nurs Midwifery Res*. 2013;18(3):228-231.

7. Wilson, B, et al. *Nurse's Drug Guide 2008*. 1st ed., Prentice Hall, 2008.

8. Vallerand, A. H., & Sanoski, C. A. Davis's drug guide for nurses (15th ed.). Philadelphia, PA: F. A. Davis Company. 2017. 9780803657052

9. Institute For Safe Medication Practices. 2021. ISMP Targeted Medication Safety Best Practices for Hospitals. https://www.ismp.org/sites/default/files/attachments/2020-02/2020-2021%20TMSBP-%20FINAL_1.pdf. Published 2020-2021.

10. . Institute For Safe Medication Practices. High-alert medications in acute care settings. 2018. www.ismp.org/recommendations/high-alert-medications-acute-list.

11. Institute For Safe Medication Practices. The differences between human error, at-risk behavior, and reckless behavior are key to a just culture. 2020. www.ismp.org/resources/differences-between-human-error-risk-behavior-and-reckless-behavior-are-key-just-culture.

Elizabeth Sassatelli has over 30 years of clinical experience as an RN. She is an assistant professor at the University of Tampa, Fla.

The author and planners have disclosed no potential conflicts of interest, financial or otherwise.

DOI-10.1097/01.NURSE.0000829888.93146.5d