Accurate reconciliation of orders during transitions in perioperative phases of care

Vizient Patient Safety Organization Safety Alert
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Background

Computerized provider order entry improves patient safety by reducing errors associated with legibility, providing clinical decision support and comprehensive documentation, and improving communication between health care providers. However, when electronic orders are not designed, implemented or used appropriately, they can introduce a set of risks that can negatively impact patient care.[1-3]

Electronic orders must be reconciled as a patient moves through each perioperative phase of care. However, reconciling electronic orders in the perioperative environment can be challenging due to the fast pace; frequent changes in location, health care providers and medications; and the overall complexity of patient care. Despite being one of the most medication-intensive locations — and one in which errors are more likely to result in harm — the perioperative setting operates with fewer safety processes and double checks.[4-7]

Perioperative medication safety has largely focused on errors during preparation and administration,[4,5] however, inaccurate medication reconciliation poses safety risks that often involve omissions or continuing medication(s) in the pre- and postoperative phases.[6,7] The use of a single blanket order to "resume all" orders has long been known to contribute to medication errors, even when paper medical records are used. The seriousness of this issue was detailed in The Joint Commission's January 2006 "Sentinel Event Alert," which pointed out that the use of blanket orders — such as "resume all preoperative medications" — caused failures in medication reconciliation and serious adverse events.[8] Despite such orders being strictly prohibited in the medication standards,[9] the option to "resume all" orders is still available in the electronic health record (EHR).

Sometimes, the way in which electronic orders are designed may not always mirror the actual clinical workflow, and can cause interruptions in care when special circumstances arise. In addition, as a patient moves into perioperative status, orders are often placed on "hold" in the EHR, which increases the risk of errors occurring during transitions in acute care.[10,11]

Assessment

Errors in managing and reconciling orders in the EHR through the perioperative phases of care were identified during a review of care coordination and communication event reports submitted to the Vizient® Patient Safety Organization (PSO) by its participating members. The Vizient PSO staff searched the data for additional perioperative order events to improve our understanding of the types and causes of these errors in the EHR. The most common perioperative order issues involved:

- An entry error or the omission of a required action as part of the defined workflow that resulted in an issue in either the current or subsequent phase of care
- Errors and omissions when reconciling orders

The factors that contribute to errors in perioperative orders are shown in Figure 1; these factors are described in more detail below.

Figure 1. Factors involved in electronic perioperative order events[a]
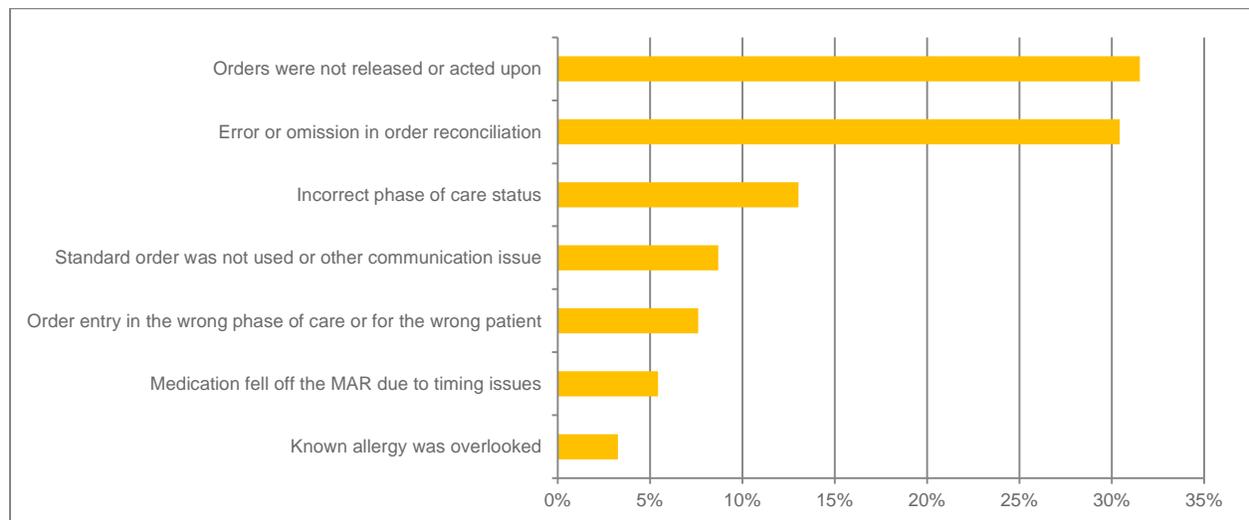
Source: Vizient Patient Safety Organization.
[a]Period of data: January-December 2017; total number of events = 93.
Abbreviation: MAR = medication administration record.

Errors in the sign, held and release process

Although processes vary by electronic medical record types and software versions, processes for perioperative phases of care enable providers to place orders that will be delivered during specific phases of care; these orders automatically discontinue at patient transfer. Orders are released and documentable at the phase of care for which they are ordered. We found that many errors involved perioperative orders that were "signed and held" by the physician, but were not "released" by the receiving nurse pre- or postoperatively. On

the inpatient floor, unreleased preoperative orders meant to prepare a patient for surgery were not carried out; therefore, the patient's medication was not held before surgery and the procedure had to be postponed. More commonly, postoperative floor orders were not released on the inpatient floor, causing medication omissions and/or the administration of discontinued post-anesthesia care unit (PACU) medications on the floor.

Errors in the phase of care status

Errors occurred when patients were not moved from the inpatient unit or ambulatory setting to the perioperative area in the EHR. This omission disrupted the designed flow of perioperative orders, which prevented the pre-, intra- and PACU orders from falling off the medication list upon transfer to the floor. Consequently, the medication that had been discontinued in the PACU was administered on the floor. In other cases, when a patient's admission status was "pending" or transitions from ambulatory encounters were entered incorrectly in the EHR, interruptions occurred in the ability to enter perioperative orders, transfer the patient, and view or release orders on the floor. Conversely, when a patient's status was erroneously changed to "perioperative," orders were placed on "hold" on the inpatient unit.

Orders entered in the wrong phase of care

Sometimes, perioperative orders were entered in the wrong phase of care, such as intraoperative orders being entered under postoperative floor orders, or vice versa. For example, a postoperative order for heparin was erroneously placed in the intraoperative orders, so the order fell off the medication administration record (MAR) during transfer to the floor and was not carried out. In other cases, postoperative orders were released before a patient was transferred to the floor. Because releasing orders before the next phase of care was not the standard process and there was a lack of communication, the receiving nurse missed the orders and they were not carried out. In some events, the surgeon entered orders in the wrong patient's record.

Errors or omissions in order reconciliation

During perioperative transitions, providers often erroneously overlooked or carried orders over to the next phase of care during reconciliation, resulting in omissions in care. In the preoperative phase, patients' home medications were often not reconciled or a medication was omitted from the list and was not available to the nurse on the floor. Other reconciling order errors resulted in duplicate therapy for pain medications or anticoagulants, treatment omissions and medication orders written for patients with known allergies to those medications. When orders were not reconciled prior to transfer postoperatively, the MAR remained in a "hold" state and could not be viewed, accessed or released.

Other factors involved in events

Other factors were involved in electronic order events. For example, during a postoperative transfer to the floor, medication that needed to be administered fell off the MAR when the medication "hold" was removed and the time to administer was past due. Other events involved communication orders (e.g., text entry orders), which are unlike standard medication orders that are visible to the pharmacist or easily visible on the MAR prior to administration. For example, when a preoperative "hold medication prior to surgery" communication order was missed, the medication was administered and the procedure had to be postponed. In a near miss example, communication orders were used instead of standard recovery orders, which could have been overlooked or not visible to providers at the next phase of care.

Level of harm

As a result of the perioperative order issues that occurred during transitions in phases of care, medication or treatment was not given or was incorrectly given, patient care was delayed or therapy was duplicated. Figure 2 displays the harm scores assigned to perioperative order events. Most events were near misses or did not result in harm to the patient, but over 20 percent caused emotional distress, temporary harm or required additional treatment to be administered.

Figure 2. AHRQ Common Format Version 1.1 harm assigned to perioperative order events[a]
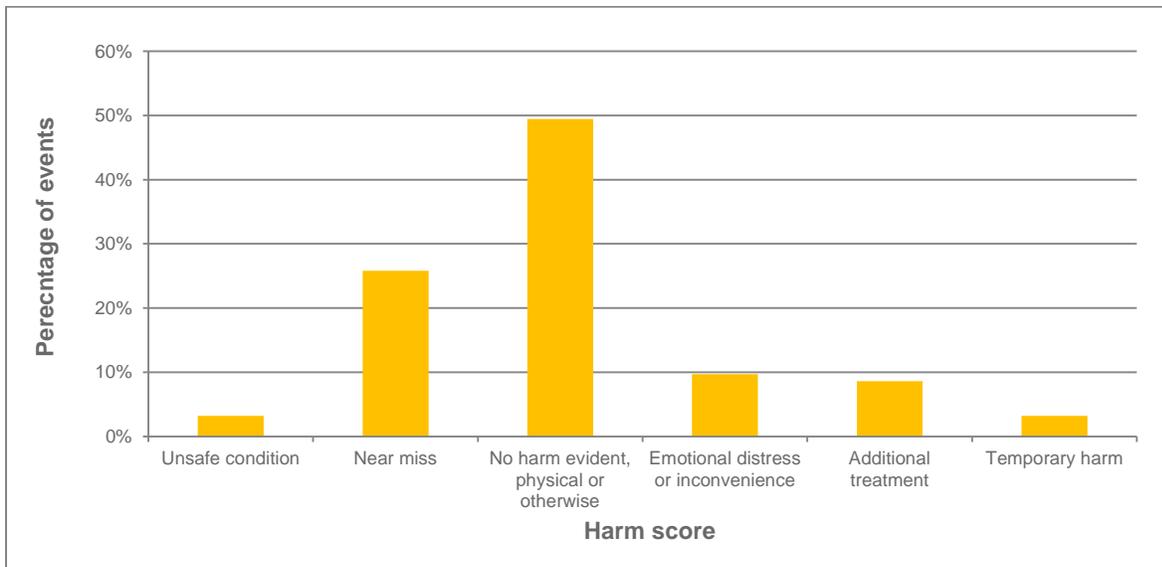
Source: Vizient Patient Safety Organization.
[a]Period of data: January-December 2017; total number of events = 93.
Abbreviation: AHRQ = Agency for Healthcare Research and Quality.

Recommendations

To reduce electronic order-related errors during transitions in perioperative phases of care, consider the following recommendations on procedures, EHR design, and hospital culture and training, all of which were developed by an expert advisory team (Appendix A):

Develop procedures and design the EHR to address risks

- Prohibit the use of "resume all" previous medication and treatment as a blanket order,[9,11] and ensure that orders are up-to-date and reflect the current needs of the patient.[12,13]
- Develop evidence-based order sets to minimize omission errors; review and update them regularly.[3]
- Develop an electronic process to ensure that previous orders are reviewed and reconciled accurately, and that orders are designed to provide easier comparisons between care areas, including:
  - Side-by-side review and reconciliation of orders between care areas[14]
  - Medication orders grouped by therapeutic drug class to enable easy recognition of therapeutic duplication[14]
  - Decision support and prompts to ensure orders are released at the appropriate phase of care[14]
- Establish a written policy that identifies the specific types of orders (e.g., signed and held orders) that are acceptable and when orders in each phase of care can be written, signed, held, released or made visible to other caregivers.[9]
- For "hold" orders, require specific instructions about when a medication should be administered in clearly defined circumstances that become active upon the release of the orders on a specific date(s) and time(s).[9] Require thoughtful reconciliation to ensure that medication(s) are resumed based on a patient's condition.
- Employ specific drug decision support and alerts that provide feedback to the provider on potential errors during order reconciliation, including drug-drug and drug-allergy contraindication checking.[4,5,7] At the end of the procedure, require that the surgeon and anesthesiologist reconcile previous and pending orders based on a patient's current status. For complex medical patients, use a handoff between the surgeon and hospitalist (or attending physician) to ensure all surgical and medical needs are addressed in the postoperative orders.
- Minimize the use of free-text entry and communication orders, which can be easily overlooked.[3]
- Clearly and concisely delineate responsibilities within each phase of care for all parties, including surgeons, anesthesiologists, nurses, other clinicians and the implementation team. In addition, indicate who is responsible for electronically:
  - Moving the patient's status through each phase of care — from outpatient or inpatient floor to the pre-, intra-, and postoperative area (e.g., PACU, inpatient floor or discharge)
  - Reconciling and placing orders during each phase of care

- Releasing and acting on an order

- Develop electronic processes and forcing functions to ensure that:
  - Physicians are actively reconciling orders versus clicking "resume all orders"
  - Patients are moved into the correct phase of care status
  - Patients are not transferred to the next phase of care until orders are reconciled
  - Orders from a previous phase cannot be carried out during the next phase

- Ensure that clinical pharmacists with enhanced specialty training are an integral part of the operating room team and involve them in medication reconciliation during perioperative care transitions to decrease the incidence of medication errors.[6,12,15]

- Standardize tools and methods for hand-off communication during transitions (e.g., forms, checklists, protocols or mnemonics), which synthesizes critical content including illness severity, patient summary, to-do action list, contingency plans, allergy and medication lists, code status, and dated laboratory tests and vital signs.[16]

Foster a culture of safety and learning

- Create a culture of safety, learning and accountability by encouraging near miss and adverse event reporting in the perioperative environment.

- Encourage multidisciplinary clinical and support staff, health IT staff, and EHR developers to identify opportunities to improve the safety of perioperative orders and effective clinical use.[3]

- Develop processes and an effective decision-making structure to ensure EHR-related events in the perioperative environment are systematically identified, reported and promptly addressed to reduce recurrences, and share lessons learned.[3]

- Conduct regular audits of medical records for errors in reconciling orders including delays, omissions and duplication of treatment.[3]

- Measure and monitor key performance indicators such as health IT-related medication errors for improvements in safety.[3]

- Report EHR-related events in the perioperative environment to your PSO; this expedites the understanding of safety issues so that best practices can be shared and applied across organizations to mitigate risk.[5,7]

Provide education and training

- Educate, train and test clinicians on order entry and the reconciliation process in the perioperative phases of care before issuing login credentials.[3]

- Ensure that users are educated on EHR changes before they occur and their feedback is obtained on those changes.[3]

- Ensure EHR support is readily available to users to address learning needs and timely assistance is provided when technical problems arise.[3]

For additional questions or information, contact Tammy Williams, collaborative advisor, or Ellen Flynn, associate vice president, safety, Vizient PSO.

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Appendix A. Expert advisory team

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