October 19, 2023 | Volume 28 ■ Issue 21

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

Temporarily holding medication orders safely in order to prevent patient harm

Problem: Holding, suspending, or temporarily stopping medication orders based on clinical circumstances is a common requirement during the course of patient care. However, if the workflow in the electronic health record (EHR) for holding medications has not been carefully vetted, medication errors can occur. As far back as 2006, reports from the Pennsylvania Patient Safety Reporting System (PA-PSRS) have demonstrated that high-alert medications, including certain anticoagulants, antihypertensives, and antidiabetic agents, represent the most common medications implicated in medication error reports associated with the use of hold orders.[1] We know that other medications can be involved as well. Failure to hold a medication or neglecting to restart or discontinue a held order when indicated can lead to harm.

Types of Hold Orders

There are several scenarios in which medications may need to be held, and each presents unique challenges regarding the proper actions that need to be taken to safely hold and resume medications.

- **Manual hold.** In some organizations, practitioners can manually put medications on hold temporarily to avoid inappropriate administration or discontinuation, and then resume them when appropriate.
- **Prescribed parameters for holding.** Medications may be held in accordance with prescribed parameters based on the patient's current condition. For example, if a patient is receiving an antihypertensive agent and their blood pressure drops below a prescribed, specified value, the medication should not be administered.
- **Hold for a procedure.** When patients undergo procedures, certain medications may need to be held before and/or shortly afterwards. Organizations might also have hold functionality in their medication administration records (MARs) that automatically puts all orders on hold status when a patient's location is updated in the EHR (e.g., medical-surgical unit to the operating room [OR]), and only a prescriber can release the medications by reordering them.
- **Hold based on protocols.** Medications may be placed on hold under clearly defined circumstances. For example, holding medications based on a laboratory result or transfer from the emergency department (ED) or post-anesthesia care unit (PACU) to an inpatient location. The Joint Commission's National Patient Safety Goal (NPSG) 03.05.01 requires hospitals to use approved protocols and evidence-based practice guidelines for perioperative management of patients receiving anticoagulants (e.g., bridging medications, when to stop an anticoagulant, timing and dosing for restarting an anticoagulant).

Error-Prone Process

Based on EHR functionality and configurations (e.g., vendor, organization, end-user), practitioners may not have easy access to the critical information they need to safely hold and/or resume medications at the appropriate time. Sometimes this is due to a simple lack of communication among

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Process for using Merck's new prefilled diluent syringe is error prone. Merck recently received US Food and Drug Administration (FDA) approval for and has begun distributing new prefilled sterile diluent syringes (packaged separately) (**Figure 1**, page 2) for reconstituting a lyophilized powder vial of **M-M-R II** (measles, mumps, and rubella), **VARIVAX** (varicella), and **PROQUAD** (measles, mumps, rubella, and varicella) live virus vaccines. The diluent was formerly available only in vials. In general, prefilled syringes are great, but in this case, they are already causing medication errors and creating increased risk. The syringes are labeled "**STERILE DILUENT FOR RECONSTITUTION OF MSD LIVE VIRUS VACCINES**." The company's

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IMPORTANT! Read and utilize the Acute Care Action Agenda

One of the most important ways to prevent medication errors is to learn about problems that have occurred in other organizations and to use that information to prevent similar problems at your practice site. To promote such a process, selected items from the **July – September 2023** issues of the ***ISMP Medication Safety Alert! Acute Care*** newsletter have been prepared for use by an interdisciplinary committee or with frontline staff to stimulate discussion and action to reduce the risk of medication errors. Each item includes a brief description of the medication safety problem, a few recommendations to reduce the risk of errors, and the issue number to locate additional information.

The **Action Agenda** is available for download as an Excel file (www.ismp.org/node/102608). **Continuing education** credit is available for nurses at: www.ismp.org/nursing-ce.

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practitioners, different interpretations about what a "hold" order means, or how documentation in the EHR is done (e.g., when the medication should be held and for how long; the prescribed parameters for holding the medication; when it might be appropriate to discontinue the medication; when, by whom, and under which conditions it should be resumed). In fact, a lack of clarity may also contribute to confusion regarding when to restart an order.

Additionally, instructions to hold a medication (with or without parameters) might not be easily visible to nurses viewing the MAR. In some systems, nurses must hover the cursor over the order to view the parameters. Screen limitations may require scrolling, browsing, or searching for parameters that may not be readily apparent upon first look. In other cases, the medication order might not indicate which parameters should be met to hold the medication. Or a prescriber may document this information outside of the medication order (e.g., nurse communication form, prescriber note); thus, it is not on the MAR. If this information is not easily visible on the MAR, the nurse may not hold the medication as intended. In addition, sometimes there is no place in the EHR to indicate when to resume the medication, under what conditions, and by whom.

Also, uncertainty with EHR hold order functionality may lead to inconsistency in the way practitioners implement hold orders. For example, some may use a manual hold function, while others may discontinue and re-enter orders to start the medication at a future date/time. Without a standard process for holding or resuming a medication, practitioners can easily overlook the medications when they should be held, or forget to start them again.

Medication Errors

Practitioners continue to report errors associated with holding medications. A few examples are listed below:

*A patient developed severe renal impairment requiring dialysis. The prescriber held the patient's met**FORMIN** order. A few days later, the patient was moved to a transitional care unit (TCU). During medication reconciliation, the admitting prescriber at the TCU resumed all home medication orders, including met**FORMIN**, which should have been held per the patient's care plan. The patient received met**FORMIN** for several days before being discharged and readmitted to the hospital with lactic acidosis.*

*A prescriber placed an order to hold the patient's **ELIQUIS** (apixaban) prior to cardiac catheterization, but the patient had already received a dose, which resulted in the catheterization being postponed.*

*A prescriber ordered a patient's **XARELTO** (rivaroxaban) to be held for a pending procedure. The patient ended up not needing the procedure, but the prescriber failed to resume the drug for several days. The patient developed deep vein thrombosis bilaterally and had a pulmonary embolism.*

A prescriber asked the nurse to hold a patient's oral medications prior to a procedure. The prescriber did not place the orders on hold in the EHR, and the pharmacy dispensed the medication doses. The procedure was delayed, and a covering nurse, who was not aware that the oral medications should be held, administered the patient's morning medications without reviewing the MAR prior to administration. When documenting medication administration after the fact, the covering nurse saw that the patient's primary nurse had documented "not given, NPO for procedure" and identified the error.

*A patient was scheduled to receive 1 g of ce**FAZ**olin every 24 hours for a central line infection. The order stated that, on dialysis days, the ce**FAZ**olin should be held until after the dialysis session. The patient's dialysis session was rescheduled for the following day, but the nurse did not administer the scheduled dose of ce**FAZ**olin.*

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instructions and promotional materials say the syringes should be used to reconstitute the associated vaccine, withdraw the liquid back into the syringe, and then administer (www.ismp.org/ext/1269). However, at the same time, the instructions do not mention the need to relabel the diluent syringe with the vaccine name after reconstitution. So, if there are other prefilled syringes nearby, and they are left on a table or countertop, all will be labeled only as sterile diluent in the same way, and will all look alike. That could lead to someone inadvertently picking up and injecting an unmixed diluent syringe, or not knowing a syringe is already reconstituted, resulting in someone getting a double dose or two different vaccine products. We have already received an error report as well as a complaint about the situation. Also, this removes the option of having parents read the syringe label as part of a process to confirm the right vaccine is about to be given, since it will read "sterile diluent." By the way, there are other vaccines such as GSK's **PRIORIX** (measles, mumps, and rubella vaccine, live) (www.ismp.org/ext/1270), and Pfizer's **ABRYSVO** (respiratory syncytial virus vaccine) that use prefilled sterile diluent syringes, and share the same problem (see the following ***Safety* brief** about a related error).

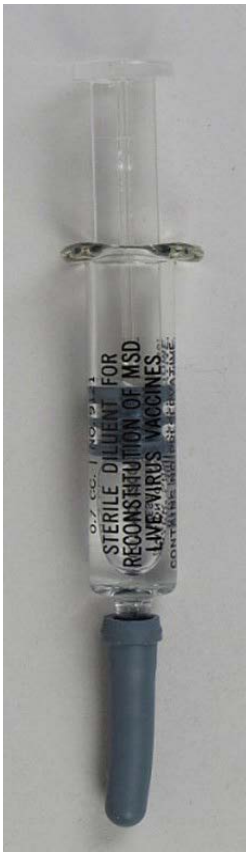

Figure 1. Prefilled diluent syringe for use with Merck vaccines must be relabeled with the vaccine name after reconstitution.

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A physician requested a gastroenterology consultation to determine if a patient was having a gastrointestinal (GI) bleed. The prescriber wrote an order for the patient's warfarin to be held prior to the endoscopy, but did not discontinue the warfarin. Per the organizational protocol, the pharmacist interpreted this to mean the warfarin should be stopped, then discontinued the order in the EHR. The GI prescriber performed the endoscopy, which showed benign results. Following the procedure, the GI prescriber resumed orders for all the active medications using the patient's MAR as a reference. Since the warfarin was no longer an active order, it was not listed on the MAR, and therefore not reordered. Six days later the patient suffered a stroke as a direct result of inadequate anticoagulation.

Safe Practice Recommendations: While there are a variety of circumstances where medications must be placed on hold, consider the following recommendations to limit the risk of errors.

Evaluate EHR functionality. Understand the various ways that medications can be placed on hold in your EHR system and then restarted. Whatever the hold functionality is, it is important to be mindful of the downstream implications for end users. Evaluate the clinical decision support (CDS) alerts (e.g., drug-drug interaction, duplicate therapy, automated dispensing cabinet [ADC] display message) configured in the system, and ensure the appropriate practitioners are receiving applicable system warnings related to the held/resumed medication and addressing them at the appropriate time.

Define when hold parameters are required. Identify which medications should be held when based on a specific parameter (e.g., heart rate, blood pressure) and build required fields in the EHR that the prescriber must enter prior to placing the order. Otherwise, create protocols that require practitioners to reference certain conditions (e.g., laboratory results) to hold a medication order.

Build clinical decision support (CDS). Leverage CDS, such as an alert upon scanning an antihypertensive agent, if the patient's blood pressure is outside of the ordered parameter prior to administration. Also, review hold order settings. In some EHR system configurations, organizations can define when the system will alert the provider to review the hold order based on how much time has passed since the medication was held or last reviewed (e.g., 48 hours). After the configured amount of time has passed, the system can be set up to display a colored warning banner and icon everywhere the held medication is displayed to indicate that the held medication needs to be reviewed. In addition, some systems can be configured to send a notification to the prescriber and/or set a maximum length of time medications can be held. If your system does not have these capabilities, provide feedback to your vendor. Consider adding a hold order review to an interdisciplinary rounding checklist or assign a daily hold order review to a designated individual (e.g., pharmacist, nurse).

Make held orders visible. Assess the functionalities of held orders within your institution. They should be visible to all practitioners on all medication lists and the MAR, and should clearly indicate how long the medication is on hold (e.g., number of doses, number of days) if known. The order should not allow pharmacy to dispense the doses, and the MAR should not prompt a nurse to administer the drug.

Define policy on medication hold orders. Establish a policy that defines what constitutes a hold versus a discontinue order, and when or how the hold will be used. Determine which medications can be placed on hold, under what circumstances/conditions, and if there are medications that should never be placed on hold. Work with frontline staff to determine the workflow and to learn what issues they commonly see when medication orders are put on hold. Determine how to manage each type of situation and clearly address each issue in the policy. Ensure that when a patient has an order to have nothing by mouth (NPO), or feedings are stopped for a procedure, a designated individual is reconciling and evaluating all current medications for changes as necessary.

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We reached out to FDA and the manufacturer to notify them of this concern and recommended that manufacturers provide self-adhering labels, packaged with the specific vaccine, for use on the diluent syringe after the vaccine is reconstituted and withdrawn from the vial. For now, to reduce risk with these syringes, create vaccine-specific auxiliary labels to facilitate relabeling. Store the labels with the specific vaccine products.

Influenza vaccine mistaken as diluent meant for RSV vaccine. Pharmacies reported two recent close calls involving patients who were supposed to concurrently receive **FLUZONE** (influenza high-dose vaccine) and **ABRYSVO** (respiratory syncytial virus vaccine). Abrysvo is available in a vial containing lyophilized powder antigen. A practitioner must first dilute it using an accompanying syringe of sterile water for injection and a vial adapter. However, instead of connecting the Abrysvo diluent syringe to the vial, those preparing the vaccines have mistakenly used Fluzone high-dose syringes (**Figure 1**). Fortunately, in both cases, the error was recognized prior to administration.

Figure 1. Rather than using an Abrysvo diluent syringe (right), a practitioner connected the Fluzone high-dose syringe (left) to the Abrysvo vial via an adapter for reconstitution.

The diluent syringe for Abrysvo looks similar to the Fluzone high-dose syringe, and the dark plunger stoppers make it difficult to read the labels. In addition, both the diluent syringe and the Fluzone syringe have Luer connectors, making them compatible with the vial adapter. A similar error could occur with other powdered vaccines when

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Designate a prescriber for medication reconciliation. Organizations and institutional leadership must have a formal process outlining the designated prescriber (e.g., hospitalist, surgeon) responsible for completing medication reconciliation during transitions of care (e.g., admission, transfer, procedure, discharge).

Reconcile medications. Evaluate the medication reconciliation process as it relates to hold orders during transitions of care (e.g., patients going to and from the OR where medications are often held and need to be resumed at a later time). Avoid orders such as, "resume all pre-op medications" or "continue all prior medications." All new postoperative medication orders should be reconciled with previously prescribed medications; prescribers should not rely solely on summaries for patient medication orders. A review of medications held and discontinued is also essential, and this information needs to be communicated during handoffs.

Educate practitioners. Many of the medication errors that occur result from practitioners not understanding the use of the hold order process as it relates to the EHR technology. Educate staff on your organization's medication hold policies, procedures, and protocols during orientation and annual competency assessments. Include examples of held medication-related errors that have occurred and encourage practitioners to question any suspect orders or hold orders without an explanation.

Educate patients. Inform patients which medications are being initiated, continued, discontinued, or adjusted, including those that should be held, for how long, and why. Document this information on the discharge medication list so that the patient has a clear understanding of their care plan. Discharge documentation must be clear for patients so that they know what medications to stop and what medications might be on hold for a certain period of time until specified conditions are met.

Learn from errors. Review internally reported medication hold-related errors as well as published external events such as those described in this newsletter. Encourage all staff to report close calls and actual errors that have occurred, focusing on errors that occurred during transitions of care.

References:

1) Pennsylvania Patient Safety Authority. Hold on to these orders. *PA-PSRS Patient Saf Advis.* March 2006;3(1):33-4.

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diluents and other vaccines kept nearby and are in prefilled Luer-lock syringes.

We have notified the US Food and Drug Administration (FDA) about this issue. Establish a process to keep vaccines and their corresponding diluents together if storage requirements do not differ. Dispense the products together in a bag with an auxiliary label to remind staff to reconstitute prior to administration. In the pharmacy, if patients require multiple vaccines in which one requires reconstitution while others do not, prepare only one vaccine at a time. For example, start with the vaccine that needs reconstitution and after preparing and labeling the syringe, retrieve and ready the other vaccine. Barcode scanning prior to preparing and administering a vaccine could help identify an error if the system is set up to require scanning of both the vaccine and corresponding diluent barcodes.

Special Announcements

Virtual MSI workshop

Don't miss the opportunity to register for our last ***ISMP Medication Safety Intensive (MSI)*** workshop in 2023. The unique 2-day virtual program will be held **November 30** and **December 1, 2023**. For more information and to register, please visit: www.ismp.org/node/127.

Foundations in Medication Safety

ISMP's new online, interactive course offers healthcare organizations a standardized, cost-effective way to ensure staff involved in the medication-use process have the basic knowledge they need. For more information, please visit: www.ismp.org/node/74900.

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ISMP Medication *Safety Alert!* Acute Care (ISSN 1550-6312)

Report medication and vaccine errors to ISMP: Please call 1-800-FAIL-SAF(E), or visit 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.

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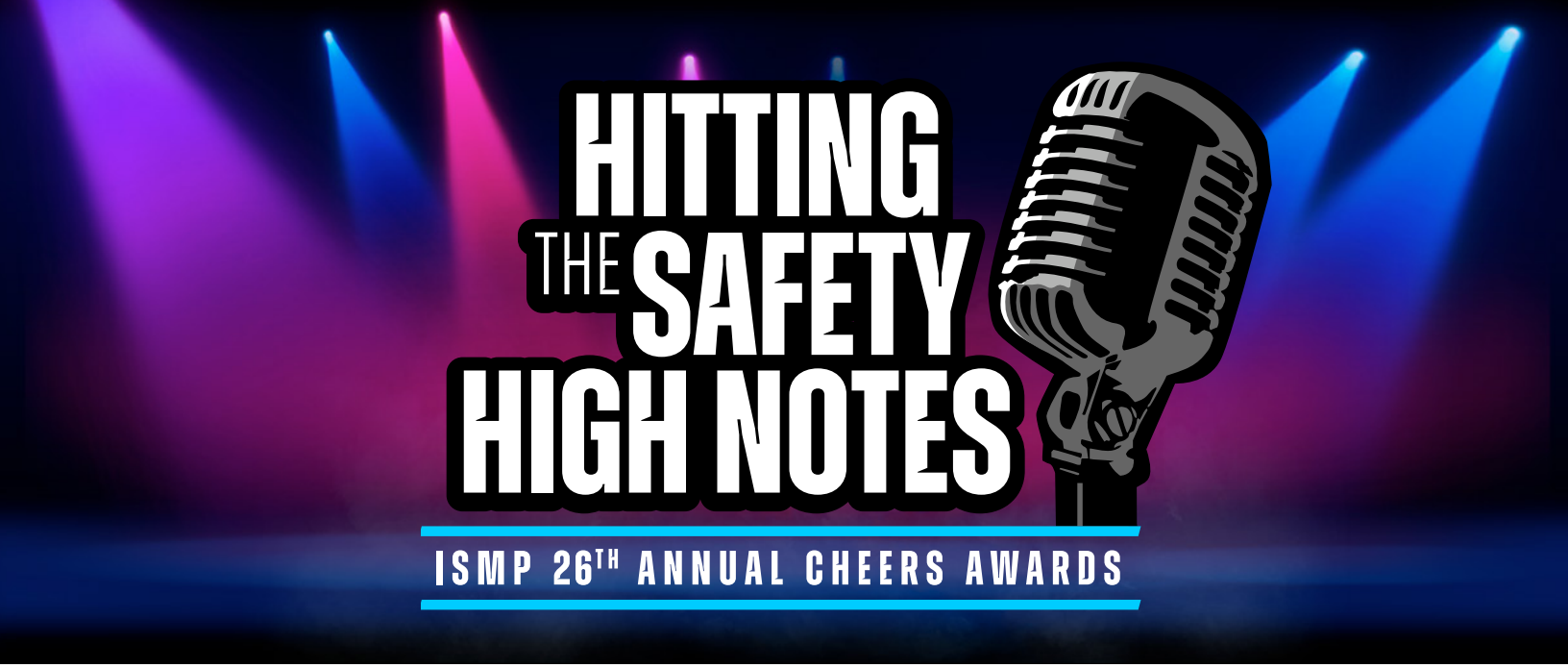

Tuesday, December 5, 2023

House of Blues – Anaheim

ISMP is showcasing medication safety stars at the 2023 Cheers Awards dinner, and we would love to see you there.

You can help honor this year's Cheers Award winners by attending the awards dinner and/or supporting the event. Your participation helps bring attention to safety advances and enables ISMP to continue the core of its lifesaving work – preventing medication errors.

Guest Speaker:

RaDonda Vaught

RaDonda Vaught is a former nurse criminally prosecuted for a fatal medication error who has a compelling story to tell. RaDonda self-reported her error and provided detailed information to help prevent similar mistakes in the future but was convicted of two felony charges and lost her nursing license. ISMP and many other healthcare organizations have spoken out in support of RaDonda and against the criminalization of medication errors. Today she is a passionate advocate for system-based medication safety and second victims of errors.

To show your support, visit:
www.ismp.org/node/83407

Register to attend:
www.ismp.org/node/34374

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