

Scanning Too Many Orders at Once

The Result: Drug Orders Are Omitted

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PROBLEM: Technology that is intended to improve safety and efficiency occasionally produces unforeseen error-prone conditions. Such is the case with an order-management scanning system (OMSS). The scanner captures a digital image of a handwritten or printed medication order and routes it to the pharmacy, eliminating the need for physically obtaining the order, faxing it, or using a courier or a pneumatic tubing system. The many advantages of this technology include:

- less time for the order to reach the pharmacy.
- decreased turnaround time from prescribing to the availability of medications for administration.
- electronic filing, maintenance, and easy retrieval of scanned orders in the pharmacy.
- documentation of quality-associated comments with the use of highlighting and notations.
- a potentially lower risk of transcription errors.
- capability of enlarging any questionable areas of the order.

Unfortunately, these advantages can be compromised if the pharmacy does not receive an order. This can happen when multiple pages of the orders are pulled through the scanner at the same time. As a result, only a single page is scanned into the system. The same problem can occur during faxing or copying orders for the pharmacy. Unit staff members who scan the documents might be unaware of what happened and may assume that all orders were scanned and sent to the pharmacy. Pharmacy staff members are also

unaware that they should have received multiple pages in their workflow queue. Consequently, important drug therapy may be missed.

The following event was reported to the Institute for Safe Medication Practices:

A physician wrote admission orders on three pages for a lung cancer patient with *Clostridium difficile* colitis and fever. The orders were scanned with the OMSS and were received by the pharmacy, but one page was pulled through the scanner together with another page. Therefore, the pharmacy received only two pages.

Neither the pharmacist nor the nurse who checked the computer-generated medication administration record (MAR) noticed that a page was missing. The physician did not notice the error either, as he did not routinely review the patient's MAR. Several seizure medications had been prescribed on the missing page.

By the fourth day of admission, the patient exhibited bizarre behavior and experienced confusion and hypoxia. A rapid-response team determined that the patient might have had a seizure. The patient was transferred to a critical-care unit, where his condition worsened and intubation was required. When the drug levels of his prescribed anticonvulsants were reported to be low, the physician discovered the error. Later, extubation was performed successfully and the patient fully recovered.

When this event was investigated, it was initially thought that the nurse had failed to scan the missing page of orders to the pharmacy. However, because the hospital had encountered missing pages of scanned orders before, the staff quickly realized that the missing page had stuck to one of the other pages during the scanning process. In fact, the hospital identified 16 scanning errors that led to medication omissions—some for the entire hospitalization of the patient—that had been reported in the hospital; four of these errors occurred in one year. Although no patients were seriously

affected because of these earlier events, many of the omissions could have been harmful, requiring intervention.

Here are examples of other mishaps:

- A patient with chronic obstructive pulmonary disease (COPD) missed oral doses of aspirin and intravenous (IV) doses of furosemide (Lasix, Sanofi) and levofloxacin (Levaquin, Janssen) for 2 days after being admitted. Only four of the six pages of admission orders had been received in the pharmacy via the OMSS.
- Another COPD patient missed doses of methylPREDNISolone and cefTRIAXone (Rocephin, Genentech) for 2 days when only three of the four pages of admission orders were received in the pharmacy via the OMSS. The patient experienced chest pain and required nitroglycerin because of respiratory problems.
- A seriously ill patient with pneumonia did not receive prescribed antibiotics for 3 days when one of the three pages of a preprinted order set did not reach the pharmacy.
- A patient who was admitted with a pulmonary embolism received the first dose of enoxaparin sodium injection (Lovenox, Sanofi) in the emergency department, but two subsequent doses 12 hours apart were not given because the medication order was on a page that had stuck to another page during the scan.

According to the pharmacist who reported these problems to the ISMP, the 16 documented cases represent just the tip of the iceberg; most instances of missing scanned order forms were captured and corrected by a pharmacist or nurse before an omission occurred. The reporting pharmacist estimated that each pharmacist on duty catches, on average, one missing page of orders per day when multiple pages are pulled through the scanner at one time. One pharmacist caught three missing scanned pages

during a single weekend shift.

At this hospital, nurses started to document the order number provided on the MAR (generated by the pharmacy computer system) next to the original medication order on the patient's chart when verifying MARS; therefore, they could not verify an order unless the pharmacy had entered it and produced an order number. Although this step helped considerably, the system turned out not to be foolproof and problems have persisted.

The ISMP contacted three of the largest companies that offer OMSS to alert them that the scanners were pulling multiple pages through while only the top page was being scanned into the system. The companies provided the following possible causes of this problem:

- Too many pages are being crammed into the scanner.
- Moisture or static electricity can cause pages to cling to each other.
- Stapled forms, folded or creased forms, forms with gummed areas, or attached perforated forms may stick to each other.
- Low-weight paper can cause the pages to stick together (although it is unknown whether thicker paper would prevent the problem).
- The scanner rollers might be worn or dirty.

SAFE PRACTICE RECOMMENDATIONS: For those who use OMSS at their facilities, an interdisciplinary team of first-line nurses and pharmacists should plan how to reduce the risk of serious drug therapy omissions caused by the multiple-page problem. One important goal is to counteract complacency and remind employees that they are scanning very important documents to the pharmacy. The following suggestions also apply to medication orders that are faxed or photocopied:

1. Prepare the pages. Before scanning any order form, remove staples and open any folded or creased sections of the form. Perforated physician order forms should be avoided when possible.

2. Limit the number of pages. Place the scanner within arm's reach of those who scan the orders. If feasible, only one page should be scanned at a time. This rule is easier to enforce if the staff knows that this step can prevent errors. To en-

courage compliance, display a brief set of "send" instructions and post a sign on or at the scanner, for example: *Warning: To prevent medical errors, never feed more than one order sheet at a time!*

One potential downside of this practice, in addition to reduced efficiency, is that each page of a group of orders for a single patient could go to a different pharmacy staff member for entry. Thus, the order-entry system should be designed in such a way that one pharmacist handles all orders from a specific patient-care area.

3. Number each page. If there are multiple pages of drug orders for a single patient, the nursing staff should number the pages before scanning them. Record the page number in a consistent location on the order sheet that does not interfere with the actual orders. Each page should be numbered sequentially, and the total number of pages should be included (e.g., page 1 of 5). Only one patient's medication orders should be scanned at a time.

All multipage, preprinted order sets should have preprinted page numbers on them in the same fashion (e.g., page 1 of 5). For hospitals that already stamp each scanned order, the stamp template should be changed to state: "Scanned page __ of __."

4. Monitor receipt. The sender should be required to verify the number of pages scanned using the "sent" confirmation feature. Depending on vendor capabilities, a nursing monitor station or "print receipt" feature may be available with the scanning device for the staff to view the number of pages that have been scanned and received in the pharmacy. In some cases, it may be possible to view the actual pages that were sent to the pharmacy or to print a copy of each order that was scanned as validation of receipt. The same order should not be sent more than once without informing the pharmacy.

5. Verify MAR entries. If pharmacy-generated MARS are used at the facility, nurses might be asked to document the order number (generated by the pharmacy computer system) next to the original medication order in the patient's medical record during verification. This step helps to detect any medication orders that have not been entered by the pharmacy.

6. Check charts. The processes associated with end-of-shift and 24-hour chart checks must be capable of detecting any medication orders that were not

transcribed onto the MAR. The original orders should be compared with the MAR line by line. If nurses write the pharmacy computer's order number next to each original medication order on the order form during MAR verification, the staff conducting chart checks should be encouraged to look for medication orders in the chart without a corresponding number and a nurse's signature.

7. Review drug therapy during handoffs. Reports during handoffs in care should include a thorough review of the patient's current drug therapy. These reports, especially at a change of shift, can quickly reveal instances when commonly prescribed medications (e.g., antibiotics) have been omitted by accident.

8. Review current orders. Prescribers should review the printout or the electronic listing of medication orders provided by the pharmacy at least every 24 hours, or they should review the previous day's MAR to help detect the omission of any orders.

9. Clean the scanners. Following the vendor's instructions, routine maintenance and cleaning the scanners' rollers and lens should be performed regularly or more often if the text on the pages being scanned is unclear.

10. Reduce variability. All scanners and user configurations should be standardized so that staff members who work on more than one unit will be familiar with their use.

11. Empower patients. Hospitalized patients and their families should be encouraged to speak up if they are not receiving a drug that they had been taking at home or if they have not been given a drug that their doctor told them they would receive in the hospital.

Most of these recommendations require the user, particularly the person scanning the orders being sent to the pharmacy, to remember to carry out specific processes. The ISMP has also encouraged vendors of OMSSs to seek solutions through technology improvements when feasible.

The reports described in this column were received through the ISMP Medication Errors Reporting Program (MERP). Errors, close calls, or hazardous conditions may be reported on the ISMP Web site (www.ismp.org) or communicated directly to ISMP by calling 1-800-FAIL-SAFE or via e-mail at ismpinfo@ismp.org. ■