A physician wrote three pages of admission orders for a lung cancer patient with C. difficile colitis and fever. The unit secretary scanned the orders using an order management scanning system (OMSS), which captured a digital image of the handwritten orders and transmitted them to the pharmacy, thus eliminating the need for fax, courier, or pneumatic tube systems. The pharmacy received only two of the three pages of orders because one of the pages was pulled through the scanner along with another page. The same problem can occur when faxing orders to the pharmacy or making copies of orders to send to the pharmacy.

The unit secretary believed all the orders had been scanned and sent to the pharmacy. Pharmacy staff were unaware that they should have received three pages of orders, and the nurse who checked the pharmacy computer-generated medication administration record (MAR) also did not notice the omission of several anticonvulsant medications that had been prescribed on the missing page of orders.

By the fourth day of admission, the patient exhibited bizarre behavior and developed confusion and hypoxia. A rapid-response team was called and determined that the patient may have experienced a seizure. The patient was transferred to a critical care unit where his condition worsened, requiring intubation. When the drug levels of his prescribed anticonvulsants were reported as low, the patient was transferred to a critical care unit, requiring intubation. When the patient was successfully extubated and fully recovered.

While investigating this event, the initial proximate cause was thought to be that the unit secretary failed to scan the missing page of orders to the pharmacy. However, because the hospital had encountered the problem of missing pages of scanned orders before, staff quickly realized the missing page had stuck to one of the other pages during the scanning process. In fact, since January 2006, 16 scanning errors that led to medication omissions—some for the entire hospitalization of the patient—had been reported in the hospital. Although no patients were seriously harmed as a result of these prior events, many of the omissions were potentially harmful and required intervention.

For example, a patient with chronic obstructive pulmonary disease (COPD) missed oral doses of aspirin and intravenous doses of furosemide and levofloxacin for 2 days because only four of the six pages of admission orders were received in the pharmacy via the OMSS. Another COPD patient missed doses of methylprednisolone and ceftriaxone for 2 days and experienced chest pain requiring nitroglycerin due to respiratory problems when only three of the four pages of admission orders were received in the pharmacy via the OMSS. A seriously ill patient with pneumonia didn’t receive antibiotics for 3 days when one of the three pages of a preprinted order set was not received in the pharmacy. A patient admitted with pulmonary embolism received the first dose of enoxaparin in the emergency department, but two subsequent doses to be given 12 hours apart were not administered because the medication order was on a page that was stuck to another page of orders.

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**Order scanning systems (and fax machines) may pull multiple pages through the scanner at the same time, leading to drug omissions**

**check it out!**

Consider the following recommendations to reduce the risk of serious drug therapy and other treatment-related omissions from scanning errors.

- **Prepare pages.** Before scanning any order form, remove staples and open any folded or creased sections of the form; avoid using perforated or double-sided order forms.

- **Limit the pages.** Place the scanner within arm’s reach of staff who scan the orders, and ask them to scan one page at a time. To encourage compliance, display a brief set of “send” instructions and post a sign—Warning: To prevent medical errors, ONLY feed one order sheet at a time!—on/at the scanner. This will be easier to enforce if staff know it could prevent errors.

- **Number the pages.** If there are multiple pages of orders for a single patient, staff should record the page number in a consistent location on the order sheet; number each page sequentially while including the total number of pages (e.g., page 1 of 5, page 2 of 5); and scan only one patient’s orders at a time. Ensure that all multi-page, preprinted order sets have preprinted page numbers on them in the same fashion. For hospitals that already stamp each scanned order, change the stamp template to state: “Scanned page ___ of ___.”

- **Monitor receipt.** Require the sender 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 staff to view the number of pages that have been scanned and received in the pharmacy.

- **Verify MAR entries.** If employing
admission orders while being scanned. According to the pharmacist who reported these problems to ISMP, the 16 documented cases represent just the tip of the iceberg, as most instances of missing scanned order forms were captured and corrected by a pharmacist or nurse before an omission occurred. In fact, the reporter estimates that each pharmacist on duty catches, on average, one instance of a missing page of orders per day caused by the scanner pulling multiple pages through at the same time.

Nurses at this hospital started to document the order number provided on the pharmacy generated MAR next to the original medication order on the patient’s chart when verifying MARs. This means that they could not verify an order unless pharmacy had entered it and produced an order number. While this helped considerably, the system was not foolproof and problems continued to happen.

ISMP contacted three of the largest companies that offer OMSS—CareFusion (Pyxis Connect), McKesson (Horizon MedComm-Rx), and Omnicell (OmniLinkRx)—to ensure they are aware of the problem of scanners pulling multiple pages through while only the top page is being scanned into the system. In addition to possibly cramming too many pages into the scanner, the companies provided these possible causes of this problem:

- Moisture or static electricity can cause pages to cling to each other
- Staples on forms, folded or creased forms, forms with gummed areas, or attached perforated forms may stick to each other
- Double-sided forms with only one side being scanned
- Low-weight paper may stick together (although it is unknown whether thicker paper prevents the problem)
- Worn or dirty scanner rollers can cause pages to cling together.

If you use OMSS at your facility, an interdisciplinary team of frontline nurses and pharmacists should meet to plan how to reduce the risk of serious drug therapy omissions caused by the scanner pulling multiple pages through at the same time. Recommendations are provided in the Check it out! column to the right, starting on page 1. Many of these recommendations also apply when faxing or making copies of orders.

### Double Trouble

**Sound-alike names.** In May 2009, FDA approved iloperidone (FANAPT) as an atypical antipsychotic agent for the acute treatment of patients with schizophrenia. A nurse practicing in a psychiatric hospital intercepted an error in which XANAX (ALPRAZolam), an anxiolytic, was confused with the new antipsychotic Fanapt. A physician had given a verbal order to another nurse for Fanapt, but the nurse misheard the drug name as Xanax and did not read back the order for clarification. Fortunately, the error was detected by the second nurse who questioned her colleague after she noticed that the pharmacy had sent a drug information pamphlet about Fanapt for the patient but there wasn’t an order for the drug. Both products are available in 1 and 2 mg oral tablets, making mix-ups more likely. Confirmation bias (hearing the drug name that is familiar, not the unfamiliar drug name that is actually said) also contributed to the mix-up. Thus, it’s important to have a process in place to ensure that nurses and other professional staff are educated about new medications before they are added to the formulary and prescribed. This is also another reason to avoid taking verbal orders except in emergent situations. When verbal orders are accepted, ensure that read-back occurs after the order has been written down in the patient’s chart.

### SafetyWires

**New TAXOTERE concentration and preparation.** New one-vial Taxotere (docetaxel) in a double concentration is replacing current two-vial Taxotere packages. Since the drug became available, Taxotere has been provided in a two-vial package—one vial with the active drug in liquid form, and the other vial containing the required diluent. The product required two dilutions prior to administration. First the diluent had to be

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Thumb accidentally injected despite EpiPen redesign

Dey Pharma, the manufacturer of EPIPEN (EPINEPHrine autoinjector) has redesigned the pen to make it less likely for users to accidentally inject the needle into their thumb or finger while trying to administer the drug. The new device requires activation of a blue safety release at the end of the pen farthest from the needle (Figure 1). Once activated, the orange tip at the needle end of the syringe is placed firmly against the outer thigh (the autoinjector is designed to inject through clothing) for approximately 10 seconds while the drug is delivered intramuscularly. However, we recently received a report in which a nurse injected her thumb using the newly redesigned device.

The nurse was using an EpiPen for the first time. She was not familiar with the device and apparently had not been taught how to use it. She was, however, familiar with the NOVOLOG (insulin aspart) FLEXPEN, which has an orange push button that is pressed to inject the insulin (Figure 1). Although the EpiPen’s orange end is clearly marked with the warning “Never put thumb, fingers, or hand over orange tip,” the nurse incorrectly assumed that, since it was a pen and had an orange tip, it operated the same way as the NovoLOG FlexPen. She held her thumb against the orange tip at the EpiPen needle end, expecting the needle to exit the opposite end once she activated the safety release. But when she pushed down on the orange end, she drove the needle into her thumb. While injecting EPINEPHrine into a thumb or finger may pose a risk (restricted tissue perfusion) to the individual attempting to administer the drug, the greater risk is to the patient who needs the drug if treatment is delayed. In fact, the situation could be quite serious if only a single pen is available.

EpiPens have been available for many years, but many clinicians have never used one or have yet to become familiar with the newly redesigned device. Other EPINEPHrine pens which may or may not operate the same as EpiPens, are also available. Instructions for proper use of EpiPens can be found at: www.epipen.com/page/how-to-use-epipen-auto-injector-index. If you are using EpiPens or similar EPINEPHrine delivery devices in emergency departments, assure that all staff know how to use them properly.

Figure 1. There’s a new EpiPen design (above), but a nurse still injected her thumb after holding it against the orange end where needle is released. The nurse was familiar with an orange push button that is pressed to release insulin on a NovoLOG FlexPen (below).

Twice a week or twice a month? “Biweekly” is sometimes used to mean once every 2 weeks. “Bimonthly” usually means once every 2 months. However, these words are likely to cause confusion. According to online and print dictionaries, “biweekly” is also used to mean twice-a-week or semi-weekly, and “bimonthly” can also indicate twice a month. So, when ordering medications and transcribing orders, it seems obvious that these words should be avoided. Instead, use and write out terms such as “twice a week,” “every other week,” “every 2 weeks,” “every other month,” or “alternate months.”

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Report medication errors to ISMP at 1-800-FAIL-SAF(E).