Point-of-Care Medication Administration: Internal Audit’s Role in Ensuring Control

The Institute of Medicine (IOM) estimates that more than a million injuries and almost 100,000 deaths annually can be attributed to medical errors. However, the IOM also emphasizes that most medical errors are not attributable to the careless actions of individuals; instead, they are the symptoms of system failure.

One strategy for reducing the number of preventable medical errors is the use of technology. Consider this example: A physician writes a prescription order. The nurse misinterprets the doctor’s handwriting and administers the wrong medication. This potentially life-threatening error is not the fault of an individual, but rather a system of using handwritten orders. The use of technology could have prevented this misunderstanding.

Bar code-enabled point-of-care (BPOC) technology is widely regarded as the technology solution that will improve the system of medication administration. The Food and Drug Administration (FDA), The Joint Commission, the Healthcare Information and Management Systems Society (HIMSS) and other organizations are all encouraging hospitals to implement BPOC technology to reduce medication errors and increase patient safety.

The Department of Veterans Affairs (VA) implemented BPOC in one of its facilities and was able to cut overall hospital medication error rates by 70 percent. This system is now implemented in all VA hospitals.

Internal auditors understand that an automated preventive control is superior to a manual preventive control. However, despite the overwhelming evidence that BPOC technology improves the quality and safety of patient care, hospitals have been slow to adopt it. A 2007 survey by the American Society of Health-System Pharmacists (ASHP) identified that less than 20 percent of hospitals are verifying at least 80 percent of orders at bedside using bar coding. The most common reasons cited for not adopting BPOC technology are implementation complexity, lack of staff buy-in and workflow changes.


How BPOC Works

Most people are familiar with bar code technology from its widespread use in the retail industry. Bar codes are a fast, easy and accurate way to enter data. However, a BPOC medication administration system is complex and involves many process owners.

Here is a high-level process overview: The medication order is entered and transmitted to the pharmacy system where a pharmacist verifies it. The order is then transmitted in real time to the bedside computer and a handheld device where it appears on a task list for the caregiver. The caregiver uses the BPOC system to authenticate the “Five Rights of Medication Administration”: right patient, right drug, right dose, right time and right route. The caregiver scans his or her bar-coded name badge and enters a secure password. Next, the patient’s bar-coded wristband is scanned, and his or her medication administration record appears on the computer screen.

The caregiver then scans all of the unit dose-packaged medications for the patient. The computer checks the database of orders for that patient, and if a patient-drug-dose-time-route conflict exists, the system generates a warning message. If no conflicts exist, the task is completed and the electronic medication administration record (eMAR) updates automatically. Charges are captured as the medication is posted to the eMAR. If a medication ordered is not administered to the patient within the expected time frame, reports alert the caregiver of the overdue tasks.

Implementation: Potential Risks

Implementation teams typically include representatives from a range of departments, including pharmacy, nursing, information systems (IS), health information management (HIM), administration and physicians. One discipline often overlooked but no less valuable to the implementation process is internal audit.

Internal audit’s focus on process and internal controls contributes to maximizing the effectiveness of the BPOC system in ways other stakeholders may not consider. Buy-in from staff can be difficult to win, and poor processes and technical issues can mean costly setbacks to the adoption of the technology. Therefore, early internal audit involvement is important to designing efficient processes and strong internal controls. The most common implementation risks are related to technology issues, workflow changes, charge capture, compliance, and insufficient testing and training.

Technology Issues Can Turn Off Users

Caregivers already burdened with a heavy workload and a bevy of regulations to follow can be resistant to adopting BPOC technology into their daily routines. However, caregiver buy-in is critical to the success of BPOC technology. And this support can be easily lost if the technology fails to work properly in the live environment.

In the case of one facility using remote handheld scanners, for instance, the wireless signal did not extend to all BPOC units at go-live. This caused the bedside scanners to lose connection. It was a significant setback to the solution’s success, as an already skeptical team of caregivers at the facility lost confidence in the technology.

However, the more technology-friendly users appreciated incorporating the electronic task list into their daily routines. As one nurse commented, it put her mind at ease knowing she could
follow the task list and verify that all of her patients’ medications had been administered. Still, others were frustrated by the new technology.

Login procedures on the handheld scanners caused problems for some. Caregivers must enter a password before scanning the medication, but not all were comfortable tapping on the small screens with a stylus. In addition, once some of the caregivers logged into the system, they had difficulty scanning the bar code, especially intravenous (IV) bags. An IV bag can have more than one bar code and determining which one to scan can cause confusion. In addition, the curvature of the bag can cause the bar code not to scan properly.

These are all examples of technical issues associated with BPOC technology that should be acknowledged and addressed up front with proper training and testing. (The end user’s IT acumen can vary from basic to advanced; thus, training should be tailored to individual needs.) Potential risks also must be identified and mediated before go-live when buy-in is most vulnerable.

**Medication Label Issues**

The FDA Bar Code Rule requires manufacturers to put linear bar codes containing the National Drug Code (NDC) number on their medications at the unit dose level. However, there are still instances where medications sent from the pharmacy will need hospital-applied bar codes, such as when medications are received without a bar code, the bar code is not compatible with the hospital scanners or when medications have to be repackaged into smaller doses. The repackaging and labeling options available to the hospital are packaging and printing labels manually in the pharmacy, purchasing equipment to automate the packaging and labeling, or outsourcing the packaging and labeling to a vendor. If the hospital repackages its own medications, controls should be in place to ensure labeling accuracy. As a last step in the repackaging and labeling process, each bar code should be scanned to ensure the correct bar code has been placed on each container and that they are readable.

Pharmacy-prepared items, such as patient-specific IVs and injectibles, will need proper labeling by the pharmacy. The pharmacy information management system (PIMS) should be capable of printing bar code labels for pharmacy-prepared items that contain a patient and order identifier.

**Potential Problems Due to Workflow Changes**

Implementing BPOC technology will require significant changes to the medication administration workflow. Internal audit can promote organizational understanding of the changes by documenting the current-state workflow and the future-state workflow in process maps. Cross-referencing the future-state risks and controls from the process map to a risk control matrix can provide a detailed description of what can go wrong and what controls can help mitigate those risks. The changes will require a detailed review of all policies and procedures involving medication administration and updating as needed prior to go-live.

Caregiver compliance with the scanning of medications is necessary for the BPOC system controls to work as intended. But technical and workflow-related issues may cause the caregivers to become frustrated and bypass system controls to administer medications. The pharmacy process is not always linear, and if a medication order is not entered on the handheld’s task list at the time the caregiver is ready to administer the medication, the caregiver may decide not to scan the medication. A common method of handling this situation is for the caregiver to scan the medication and enter an “ad hoc” order. The agreed-upon
process should be documented in policies, procedures and training manuals. And management should monitor tracking reports for scanning compliance.

Orders on the caregiver’s task list that are not administered within the expected time frame are captured on an overdue task list. The purpose of the overdue task list is to warn the caregiver of a potentially missed medication. If a medication was not administered for a specific reason – for instance, if the patient refused the medication – the caregiver should document that reason and clear the task. However, this step is often overlooked, and the control is bypassed. Some BPOC systems regularly purge the overdue task lists, leaving no audit trail of unfilled orders. One work-around is to print the task list before the system drops the overdue tasks from the list.

**What Will Change With Charge Capture**

The two most common methods of pharmacy charge capture found in the hospital environment are “charge on dispense” and “charge on administration.” Medications charged on dispense are posted to the patient’s account at the time the pharmacy dispenses the medication. Medications charged upon administration are charged to the patient’s account when the medication is administered to the patient.

The dispense category in the pharmacy system is defaulted to “charge upon administration” for patients on a BPOC unit and “charge on dispense” for patients on a non-BPOC unit. Medications dispensed from the pharmacy will be charged according to the default dispense category for the patient’s unit. The pharmacist has the latitude to override the dispense category as necessary. Medications dispensed from smart cabinets are charged at the time of dispense on non-BPOC units. The functionality to charge on dispense is disabled in machines located on BPOC units, and the medication is charged upon administration.

One advantage of switching to charge on administration is that medications dispensed but refused or not given to the patient for other reasons are not charged to the patient’s account. If returned medication was charged on dispense, the pharmacy would have to sort all of the returned unit doses and credit the patient back before returning medications to stock. This return process does not always work effectively, and patients end up being charged for medication not taken.

Operating with two different charge-capture methodologies has its challenges. Charge-capture controls are needed to prevent patients from being over- or undercharged when they transition between BPOC and non-BPOC units. For example, a patient presents to the emergency department (ED), a non-BPOC department, and the physician orders IV antibiotics and admits the patient to the intensive care unit (ICU). The IV antibiotics are delivered to the ED and placed with the patient on the way to the ICU – a BPOC unit.

The charge for the IV antibiotics posts to the patient’s account when the medication is dispensed to the ED. The caregiver in the ICU must scan the IV bag to document the start of the medication in the eMAR. Will the patient be double-charged for the medication? If the system is set up with this risk in mind, it will not charge upon scanning in the ICU. Whenever a patient is transferred from a BPOC unit to a non-BPOC unit and vice versa, charge-capture risks increase.
Handling of Range Orders Requires Attention

Range orders (e.g., 1-2 tablets) allow flexibility and rapid response to patient needs, but are challenging to implement with BPOC technology because they are subject to interpretation. When the system cannot match the dose administered to the dose ordered, the system sends the transaction to a review work queue.

In the case of one hospital implementing BPOC, no one was assigned to work the queue for a month after go-live, and the missing charges went unnoticed until more than half a million dollars in pharmacy charges accumulated. This omission led to a significant amount of rework and many lost charges. Going forward, the solution was to assign a pharmacy tech to monitor the work queue and resolve the edits.

Before go-live, it is important to identify all work queues and ensure someone is assigned to monitor them. Organizations should evaluate the opportunity to minimize the physician practice of writing dose or frequency range orders.

User Training Essential

The need for user training before, during and after implementing a BPOC system cannot be overstated. Indeed, this need is often greater than the user’s patience for such training, but persistence will pay off. The challenge in the caregiver environment, of course, is that available times for training are limited and unpredictable. Self-directed online training can help accomplish training objectives. This method of education should be supplemented with hands-on training when introducing new technology and processes.

In addition, a “super-user” should be designated on each shift to respond to questions and provide one-on-one feedback upon go-live. After go-live, determine what new challenges are being faced by users, and provide feedback and follow-up training as needed. Update training manuals, policies and procedures to reflect any workflow changes. The reward will be fewer work-arounds and stronger buy-in.

Summary

A well-designed BPOC medication administration system can prevent more than 85 percent of errors from reaching the patient.3 By incorporating internal audit into the core implementation team, organizations can increase the effectiveness of the application’s controls design. The reward will be a higher return on investment for this effective technology, as well as enhanced quality of care and patient satisfaction.

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3 Ibid.
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