

Importance of Medication Reconciliation in the Continuum of Care

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Poor admission medication reconciliation can follow a patient throughout his or her hospital stay and can be a major contributor to medication errors. Poor discharge planning and medication reconciliation can result in diminished quality of care, deficiencies in medication use, patient injury, and increased cost of care.

Consider the following: approximately 20% of patients experience adverse events (AEs) within 3 weeks of discharge¹; nearly 1 in 3 heart failure patients is readmitted within 1 month after hospital discharge²; and 3 of every 4 postdischarge follow-up visits occur without the benefit of a discharge summary.³ A 2011 study revealed that among 564 patients discharged from a hospital to a subacute care facility, 181 (32%) had pending laboratory tests.⁴ Of these, only 20 (11%) of the discharge summaries provided documentation of these pending tests. Other studies have also reported relatively poor documentation of tests pending at discharge.^{5,6}

The Impact of a Poor Discharge Process

The outcomes of poor transitions in care and discharge planning are shown in **Table 1.**⁷ Medicare patients readmitted to the hospital within 30 days of discharge (19.6%) cost the US healthcare system roughly \$15 billion each year.⁸ The Agency for Healthcare Research and Quality (AHRQ) found a \$412 per patient cost savings associated with patients who had a clear understanding of their hospital discharge instructions and medication use compared with patients who did not understand their instructions well.⁹

Reasons for Poor Discharge

The major reasons for poor discharge are system failures, inattention to the importance of medication reconciliation, lax standards, and poor information technology (IT).⁴ Direct communication between hospitalists and primary care physicians

Medication reconciliation represents a major challenge for organizations. Inaccurate admission medication histories can follow a patient throughout a hospitalization and contribute to medication errors and increased costs of care. Similarly, inaccurate discharge medication reconciliation can produce errors in medication therapy postdischarge, with an increased potential for readmission. Traditionally, organizations have utilized a variety of caregivers, including physicians and mid-level practitioners, to complete the medication reconciliation function, with the result being a fragmented process with suboptimal accuracy. Centralizing these functions with the pharmacy, using a small number of well-trained individuals, has the potential to improve the accuracy of this process while also reducing overall costs.

Am J Pharm Benefits. 2014;6(2):71-75

PRACTICAL IMPLICATIONS

- Current medication reconciliation processes are problematic.
- Errors in the process are a significant source of medication errors that can bring a program to a standstill if not addressed up front.
- Utilization of physicians and mid-level practitioners to perform these functions is not the most cost-effective approach.
- Pharmacy technicians present an opportunity to improve this process in terms of both clinical outcomes and financial performance.
- Pharmacists must realize that they still have the ultimate responsibility for overseeing the process and for legal review of the histories and reconciliations.

(PCPs) occurs in less than 20% of hospitalizations, and discharge summaries are available at less than 34% of first postdischarge visits.¹⁰ Inadequate communication between physicians, hospitalists, PCPs, and consultants also contributes to medication errors and potentially avoidable hospital readmissions.

In the past, a hospital receiving full payment despite its poor procedures for discharge had no incentive to improve. Even though The Joint Commission requires discharge summaries to be completed within 30 days, until now, no requirement existed to document pending tests. And IT vendors have had no incentive to create systems that can communicate with one another in this area. However, this scenario is changing rapidly, and hospitals will need to do what is right for patients and be prepared to comply with regulatory changes.

The Hospital's Task

From the viewpoint of the hospital, the discharge medication process should be improved to: (1) assure that discharge prescriptions contain no errors by reconciling them with the inpatient medication orders and the patient's prescriptions prior to admission; (2) capture all discharge prescriptions (if operating a hospital-owned ambulatory pharmacy) to improve revenue and improved outcomes; (3) educate patients on the importance of taking their medications on the schedule prescribed; and (4) reinforce with patients the importance of seeing their PCPs within 14 days of discharge. All of these actions have been shown to decrease hospital readmissions. This is a goal for which every institution is striving.

Since part of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores are calculated based on a patient's education on newly prescribed medication and the intensity of AEs from these

medications, the hospital has added incentive to ensure its discharge process is optimal.

Medication Reconciliation

Medication reconciliation is the process of comparing a patient's new medication orders with all the medications the patient had been taking prior to changing levels of care. These changes in levels of care occur as the patient moves through the healthcare system; from home to the emergency department (ED), from the ED to an inpatient bed, from a general medical-surgical unit to an intensive care unit (ICU) or vice versa, from the ICU to surgery, and from the hospital back to home or to an extended care facility. Care must be taken at

each of these transitions to avoid drug-related errors (eg, through omission, commission, duplication).

At the time of admission to the hospital, the steps include: (1) determining precisely the medications the patient was taking at home (home meds) and how the patient was taking them (ie, dosages, frequency, compliance); (2) determining which of the previous home meds must be continued while in the hospital or at the next level of care; and (3) determining what new medications the patient needs to receive in the hospital or at the next level of care.

At discharge, the steps include: (1) determining the postdischarge medication regimen based upon previous home meds, new medications received in the hospital or next level of care, and the new going-home (discharge) medication regimen; (2) developing discharge instructions for the patient for home medications; (3) educating the patient; and (4) transmitting the medication list to the follow-up physician. Oftentimes, the problem is that this process is not standardized and there are 2 to 3 different disciplines involved in the process, resulting in inconsistency.¹¹

A pharmacist's input into the admission and discharge medication reconciliation process can yield substantial results. Verbal, written, or electronic contact between a hospital pharmacist and the patient's community pharmacist is the ideal. One study discovered that medication discrepancies at discharge were disturbingly common without pharmacist reconciliation, identified in 59.6% of patients.¹²

Implementation of a pharmacist-facilitated discharge process increased recognition and resolution of these errors. Follow-up telephone calls enabled pharmacists to reinforce discharge instructions and promoted early recognition and resolution of postdischarge medication-related



problems in patients taking more than 5 medications with at least 1 high-risk medication.

Improving the Discharge Process

Several procedures can make the discharge process work better. One is the development of content and process standards, including a discharge checklist for hospitalists.¹³ The checklist should detail the processes and elements required for ideal discharge of patients. Refining the checklist for patients with specific diagnoses, specific ages, or specific discharge destinations may work even better.

Transferring important information from one provider to another is critical for improving transitions. However, even if discharge information is moved to the right places at the right times, there is the question of who is responsible for following up on the laboratory tests pending at discharge. There are 2 ways of handling this: (1) the inpatient provider completes his or her tasks at discharge and the responsibility then falls to the next provider to complete any pending tasks or tests at discharge; or (2) the inpatient provider retains responsibility for following up on any tasks or tests that he or she requested until all test results have been returned or the patient has made formal contact with the follow-up provider.¹⁴

Discharging Patients to Nursing Homes

If there is one transition of care problem that stands out, it is the “revolving door” of re-hospitalization from nursing facilities. About 40% of Medicare patients discharged from hospitals are admitted to a skilled nursing or rehab facility to complete their recovery. But within 30 days nearly 1 in 5 of these patients winds up back in the hospital.¹⁵ This revolving door problem cost Medicare \$4.34 billion in 2006. Especially in an elderly population, cycling in and out of hospitals can be emotionally upsetting and can increase the likelihood of medical errors related to poor coordination of care.

The Impact of Technology

Several types of technologies have the potential to support postacute transitions and interventions (Table 2).¹⁶ These technologies can assist with improving medication adherence and reconciliation, patient monitoring, risk assessment, and other important aspects of care transitions. They can also help with communications between and among clinicians, patients, and informal caregivers. Unfortunately, these technologies are often underutilized even though they are widely available.

Based on large-scale studies, care coordination supported by medical devices and computer-based

Table 1. Outcomes of Poor Transitions in Care⁷

| Decreased | Increased |
|----------------------------|------------------------|
| Quality of care | Mortality |
| Patient satisfaction | Healthcare utilization |
| Follow-up care | Hospital readmission |
| Patient/family preparation | Healthcare costs |
| | Medical errors |
| | Duplicative care |
| | Wrong treatments |
| | Delayed diagnoses |
| | Medication errors |

technologies can lead to fewer hospitalizations and ED visits, higher patient satisfaction and acceptance, and reductions in the cost of care.¹⁷

Making Progress

Performance measurement is one strategy with potential for improving the quality of transitional care. A valid and reliable self-report measure of the quality of care transitions that is consistent with the concept of patient-centeredness, and useful for the purpose of performance measurement and quality improvement, is available.¹⁸ The Care Transitions Measure (CTM) is a 15-item unidimensional measure of the quality of preparation for care transitions. The CTM discriminates between patients discharged from the hospital that did or did not have a subsequent ED visit or rehospitalization for their index condition. CTM scores vary significantly among health-care facilities that are known to vary in level of system integration. These scores also provide information useful to clinicians, hospital administrators, quality improvement entities, and third-party payers.

A Pharmacy-Based Solution

By training, pharmacy professionals have the most extensive background for successful medication reconciliation. Pharmacy technicians can also play a significant role in facilitating the medication reconciliation process. Current literature recognizes the value that pharmacy technicians bring to this process. A number of studies have confirmed that well-trained pharmacy technicians under the supervision and support of pharmacists are the best choice for performing admission medication histories.^{19,20} Traditionally, prescribers and mid-level practitioners have struggled with completing medication history documentation on admission as well as reconciliation on discharge because it is labor intensive and often requires contacting

Table 2. Technologies That Can Assist in Postacute Transitions and Interventions¹⁶

| Technology Applications | Example Technologies | Potential Outcomes |
|---------------------------------|-------------------------------------|--------------------------------|
| Medication adherence | Medication reminders and dispensers | Reduced hospitalization |
| Medication reconciliation | Medication list software | Increased patient satisfaction |
| Remote patient monitoring | In-home diagnostic devices | Reduced costs |
| Personnel health information | Problem detection algorithms | Improved health |
| Societal support | Videoconferencing | Increased quality of life |
| Remote training and supervision | Social networks | |

1 or more pharmacies for information. Also, it detracts from their availability for direct patient care. In addition, gathering the list of home meds is generally considered suboptimal use of physician and mid-level provider time. As with most processes, a small core group of well-trained individuals can ensure consistency and oversight.

Financially, pharmacy technicians offer an advantage over other healthcare providers in performing medication reconciliation functions. On average, 15 to 20 minutes is required to conduct and document a meaningful review of home meds. The cost for other healthcare providers to perform admission medication histories ranges from 2 to 6 times more than the cost of using pharmacy technicians.

- Pharmacy technicians—\$5 per admission
- Pharmacists—\$17 per admission
- RNs—\$10 per admission
- NPs/PAs—\$14 per admission
- Physicians—\$32 per admission (NP indicates nurse practitioner; PA, physician assistant; RN, resident nurse).

Pharmacists can be utilized as the responsible professionals to supervise the pharmacy technicians and pharmacy students in the performance of medication reconciliation activities. When medication histories are conducted and documented correctly and completely at the time of admission, the medication reconciliation process during the remainder of the patient's stay is more efficient, more accurate, and therefore consistently safer. Medication reconciliation between levels of care (eg, to and from the operating room and/or ICU) also becomes a much simpler process.

Upon discharge, pharmacy technicians can again play a significant role in assuring patient safety and in the thorough discharge medication reconciliation process. Although the pharmacist would have final responsibility for the discharge medication reconciliation sign-off, pharmacy technicians can be extremely valuable for reviewing, clarifying, and reconciling discrepancies between the admission medication history, the various

inpatient orders, and the physician's final discharge prescriptions.

Summary

Medication reconciliation is an undervalued function that can significantly impact the quality, cost, and outcome of care for a hospitalization. Traditional approaches to this process—using physicians and mid-level practitioners to perform these functions—have resulted in a fractured process with varying results. Using the expertise of residents in pharmacy to perform these functions along with pharmacy technicians as the anchor for data collection has produced significant improvements in quality and cost outcomes along with closing a gap in the continuum of care.

Acknowledgments

Special thanks to Lisa B. MacBain, MPS, for her editorial contributions and skills.

Author Affiliations: Visante, Inc, St. Paul, MN (James Jorgenson, President, Hospitals & Health Systems; Cynthia R. Hennen, Senior Consultant).

Funding source: None reported.

Authorship Information: Concept and design (CRH, JAJ); acquisition of data (CRH); analysis and interpretation of data (CRH); drafting of the manuscript (CRH, JAJ); critical revision of the manuscript for important intellectual content (CRH, JAJ); statistical analysis (CRH); administrative, technical, or logistic support (CRH).

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