"First do no harm.” This statement, part of the oath taken by physicians, also applies to pharmacists responsible for managing patients’ medication regimens. Yet studies have shown that discrepancies in medication information during transitions of care—such as hospitalization, admission to nursing facilities, and subsequent rehospitalization—account for an astounding number of harmful outcomes to patients, which often cause the patient to be readmitted to the hospital. One study of 651 hospitalized patients compared pharmacist and hospital-physician medication histories with medication orders. These researchers found more than one-third of study patients (36%) experienced order errors, defined as discrepancies resulting in changes of physicians’ orders. Eighty-five percent of patients in this study had errors that originated in their medication histories, and almost 50% were medication omissions. If undetected, 52% of order errors were rated as potentially requiring increased monitoring or intervention to preclude harm, and 12% were rated as potentially harmful.1 Cornish et al. studied patients reporting the use of at least four regular prescription medications and who were admitted to the hospital. This prospective study evaluated the frequency and potential severity of unintended discrepancies between the physicians’ admission medication orders and a comprehensive medication history obtained through an interview. Eighty-one of 151 patients (54%) had at least one unintended discrepancy. The most common error (46%) was omission of a regularly used medication. More than a third (39%) of the discrepancies were determined by researchers to have the potential to cause moderate-to-severe discomfort or clinical deterioration.2

Studies in the nursing facility setting have revealed similar results. Tija et al. examined both the sources of
discrepancies and the types of medications involved for patients transitioning from the hospital to the nursing facility for subacute care. Researchers found that almost 75% of admissions (and 21% of medications) had medication discrepancies (defined as unexplained differences between documented medication regimens). This study also found that the discharge summary and patient-care referral form did not match in more than 50% of nursing facility admissions, accounting for 62% of all medication discrepancies. Cardiovascular, neuropsychiatric, and diabetes medications, along with antibiotics, opioids, and anticoagulants, accounted for more than 50% of all medication discrepancies.  

In a related study in long-term care, Boockvar et al. examined the actual harm that was caused by medication discrepancies during transfers between acute and long-term care facilities. A mean number of 3.1 and 1.4 medication alterations occurred during transfer from nursing facility to hospital and hospital to nursing facility, respectively. Adverse drug events attributable to medication changes occurred in 20% of transfers, and the overall risk of adverse drug events per drug alteration was found to be 4%.  

Payers are also keenly interested in preventing hospital readmissions, which come at an estimated cost of $17.4 billion per year for Medicare alone. It therefore comes as no surprise that decreasing readmission rates is a major focus of the Centers for Medicare & Medicaid Services (CMS). Beginning in October 2012, the Hospital Readmissions Reduction Program, which is part of the health care reform 2010 Affordable Care Act, began penalizing hospitals with “excessive readmissions” (defined by a risk-adjusted ratio of predicted vs. expected readmission) for heart failure, acute myocardial infarction, and pneumonia, by decreasing their overall Medicare reimbursement. Other diseases/diagnoses are likely to be added in subsequent years if the program proves to be successful in decreasing readmission rates.

Pharmacists, the gatekeepers of medication safety, are stepping forward with innovative ways to try to minimize these adverse outcomes by focusing on medication reconciliation during transitions of care. In an article recently published in The Consultant Pharmacist, Novak et al. suggested that approximately 80% of patients have at least one medication reconciliation or adherence issue upon discharge. This highlights the importance of having a pharmacist reconcile the multiple medication lists and pill bottles to help identify the optimal regimen before the patient experiences an event that results in readmission. It also illustrates additional roles for pharmacists such as identifying reasons for poor medication adherence; assessing dosing adjustment needs, drug interactions, therapeutic duplications; and evaluating special medication packaging needs.

**Pioneers in Medication Reconciliation**

While the majority of studies and pilot projects have focused on the ambulatory patient, one pharmacist group in western North Carolina is focusing its medication reconciliation efforts on the long-term care setting. Neil Williams, PharmD, CPP, clinical pharmacist coordinator, Community Care of North Carolina (CCNC), and vice president of clinical services, Medication Management, LLC, Greensboro, North Carolina, and his team of clinicians have been concentrating on ways to decrease the hospital readmission rates for the state’s nursing facility residents. Williams says work began as part of a Medicare waiver that North Carolina received a number of years ago and was born from work they had already done with transitional care. This two-year pilot project reviewed 7,527 patients revealing 20,030 discrepancies—between hospital discharge information, the primary care provider’s medication list, and that patient’s understanding of his or her own medications—for an average of 2.7 discrepancies per patient. Of those 20,030 discrepancies, 6% were judged to be urgent, defined as likely to lead to an imminent hospitalization. The high number of discrepancies came as no surprise to Williams, a seasoned long-term care pharmacist. "I remember from working in long-term care pharmacy that the admission orders we’d receive always had one or more discrepancies or orders that needed..."
clarification,” he says. Often, these orders were received late in the day by the pharmacy, initiating a dangerous chain of events. “We’d receive these confusing orders at 5 p.m., prompting a call to the nursing home, which then called an on-call physician. The on-call physician was not familiar with the patient and was hesitant to make changes to the orders,” recalls Williams.

Pharmacists have been trained to review and compare medication regimens in a manner that is very unique to our profession.

Williams and his team, in collaboration with CCNC, concentrated their medication reconciliation efforts on five nursing facilities in western North Carolina during the two-year pilot project. The process involved a weekly visit to each facility in which the facility would identify all admissions and readmissions since the pharmacist’s previous visit. “The pharmacist reviewed the history and physical and discharge summary from the hospital stay to get an idea of what led up to the hospitalization, what happened during the stay, and any changes that may have been made,” says Caroline Lewis, RPh, long-term care team program coordinator for CCNC, a statewide organization based in Raleigh, North Carolina, who worked on the project. The pharmacist compared medication lists from various sources, including the pharmacy-fill history, the current medication list from the primary care provider prior to transfer to the nursing facility, the hospital admission medication list, the hospital discharge medication list and the physician’s orders, and the medication administration record from the nursing facility. Lewis and other long-term care team pharmacists identified discrepancies and, when necessary, communicated to the charge nurse or primary care provider depending on the urgency of the issue identified. During the 18-month pilot project, 1,107 medication reconciliations were performed on admissions to five different nursing facilities. The team identified 1,009 discrepancies in 409 charts. Of those discrepancies,

What Is Medication Reconciliation?

According to the Agency for Healthcare Research and Quality (AHRQ), medication reconciliation is a process to decrease medication errors and patient harm by comparing the patient’s current medication regimen against the physician’s admission, transfer, and/or discharge orders to identify discrepancies. This is accomplished by:

- Obtaining, verifying, and documenting the patient’s current prescription and over-the-counter medications—including vitamins, supplements, eye drops, creams, ointments, and herbals—when he or she is admitted to the hospital or is seen in an outpatient setting
- Considering the patient’s preadmission/home medication list when ordering medicines during a hospital encounter and continuing home medications as appropriate. In addition it includes comparing the patient’s preadmission/home medication list to ordered medicines and treatment plans to identify unintended discrepancies (i.e., those not explained by the patient’s clinical condition or formulary status)
- Verifying the patient’s home medication list and discussing unintended discrepancies with the physician for resolution
- Providing an updated medication list and communicating the importance of managing medication information to the patient when he or she is discharged from the hospital or at the end of an outpatient encounter

What is medication reconciliation?
a baseline average of 12.64% were considered to be high risk—a discrepancy with the potential to cause patient harm or significant discomfort. At the conclusion of the project, high-risk discrepancies had been reduced to an average of 6% across the five nursing facilities. More than half of the discrepancies were related to medication dose, duration, or frequency, or to a medication order or order change that was not properly documented. However, the presence of medication omissions (which occurred less frequently) was generally considered to put the patient at greatest risk. “We also found there was a false sense of security among members of the health care team that information coming from one health care facility to another was accurate,” says Lewis, a 20-year veteran of long-term care pharmacy. “The focus seemed to be more on obtaining admission orders in a timely manner, rather than on ensuring the orders are accurate.”

Lewis also explains that the reconciliation process was complicated by a lack of standardized information coming from hospital discharges and facility transfers. “Each hospital seemed to have its own process that varied depending on who completed the discharge paperwork,”

---

**Primary Goal:** Reduce the number of potentially avoidable transfers from the long-term care setting to acute care facility

**Areas of Focus**

- Medication transfers into the nursing facility
  - Medication reconciliation and review
  - Advance directives
  - Transitional care (patient transfers out of nursing facility)
  - Root cause analysis of transfer

**Team**

**Clinical Pharmacist**

- Medication reconciliation and review, facility policy and procedure review, nurse education

**Clinical Nurse Liaison**

- Data collection with root cause analysis, facility policy and procedure review, facility-specific program development, nurse education, ongoing program support and monitoring, transitional care case management

**Social Worker/Support Specialist**

- Data collection, facility policy and procedure review; patient, family, and staff education specific to advance directives and treatment-in-place (providing treatment without moving the patient from one setting to another); palliative care referrals; ongoing program support and monitoring

**Services Provided to Facilities**

- Facility assessment
- Presentation of findings
- Recommendations for action plan
- Program development for admissions and transfers
- Staff education
- Program implementation, monitoring, ongoing support

---

Community Care of North Carolina
Greensboro, North Carolina
Demonstration Project Initiatives in Nursing Facilities
she says. Hospitals sometimes had both a computer-generated list in addition to a handwritten discharge list or discharge instructions. Some used one form for patients discharged to the community and another one for patients discharged to a nursing facility. To add to the confusion, the nursing facilities were not familiar with the variations between the hospitals within their area so were unsure which form from the hospital should be used as their "official" orders. "Because it varied from hospital to hospital and facility to facility, it was a challenge trying to assist them with improving the process," says Lewis.

Lewis and Williams found that pharmacists and nurses approach medication lists very differently. "In general, nurses tended to want to carry out the physician’s orders without question," Lewis suggests. But pharmacists tend to take a very different approach. "Pharmacists have been trained to review and compare medication regimens in a manner that is very unique to our profession," she says. "The pharmacist is focused on all of the medication order details and clinical pearls that are associated with each."

That’s why Lewis and Williams agree that pharmacists need to be key drivers of the medication reconciliation process. "Long-term care dispensing and consultant pharmacists should be aware of the extremely high rate of discrepancies associated with transitional care," says Lewis. "They should focus on order changes and omissions prior to dispensing admission medications or signing the patient’s chart."

There was a false sense of security among members of the health care team that information coming from one health care facility to another was accurate.

Next Steps
Armed with their findings, Williams says CCNC is applying for several federal and state grants to expand the medication reconciliation project in the long-term care setting. "We want to extend this pilot and do it on a broad-scale basis," he explains. The goal is to create an ongoing funding mechanism (similar to the funding for medication management that occurs in the ambulatory setting) that would allow the project to continue indefinitely. One challenge to this goal lies in defining medication reconciliation as a novel service to the long-term care facility. "Consultant pharmacists, who are often in the facility only a few days a month, understand that their ability to perform medication reconciliation is limited, especially in facilities with frequent admissions," he says. This can be difficult to explain to payers such as CMS, which are already giving money to nursing facilities for consultant pharmacist services. "We are working on getting facilities and payers to understand that medication reconciliation is an additional—rather than duplicate—service that consultant pharmacists are ideally suited to provide."

Work that focuses on medication reconciliation is inherently rewarding, notes Lewis. "We knew that each discrepancy we identified might be the one that kept one more frail elderly individual from having to make another dreadful ride in an ambulance and sit for hours in a cold emergency room," she says. Though the project was largely pharmacist-driven and focused on accuracy of medication orders, the team included a social worker addressing issues about the use of advance directives and a long-term care nurse focused on nursing processes and treatment-in-place. Making facilities aware of the need for addressing transitions of care—that includes medication reconciliation—were particularly satisfying, says Lewis. "When we achieved 'buy-in' from administrative and clinical team leaders, the focus and enthusiasm was conveyed throughout the facility and had an overall positive effect on the outcome," she says. Lewis also notes that when medication reconciliation was coupled with efforts from nursing and social work to include addressing advanced directives and treatment-in-place (providing treatment without moving the patient from one setting to another), the outcomes were even more impressive. "As a result we saw remarkable improvement not only in reducing their medication discrepancies [by 63%], but also in reducing their hospital readmissions and increasing their average daily census. Those kinds of results are good for the facility, the pharmacist, and, most importantly, the patient."
Caren McHenry Martin, PharmD, is a consultant pharmacist in Greensboro, North Carolina, and a contributor to *The Consultant Pharmacist*.


© 2012 American Society of Consultant Pharmacists, Inc.

All rights reserved.


References


