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Ensuring Effective Medication Reconciliation
IN HOME HEALTHCARE

A patient was readmitted two days after discharge with severe hypoglycemia. The treating team discharged the patient on a new insulin regimen without realizing that the patient also had insulin 70/30 at home. The patient continued to take her previous regimen as well as the new one, and was found unresponsive by her husband. The patient was in the ICU with the incident likely resulting in permanent neurological deficits. (Fernandes & Shojania, 2012)

A patient was admitted to a hospital from a home health agency. The list of medications provided by the agency did not completely match the list provided by the patient's family physician (i.e., the antihypertensive agent metoprolol tartrate [Lopressor] was not listed by the agency as one of the medications that the patient was currently taking). Therefore, metoprolol tartrate was not initially ordered. The patient developed atrial fibrillation shortly after hospital admission and required a transfer to the ICU [intensive care unit]. A diltiazem (Cardizem) infusion was started and the patient's family physician became aware that the patient had not been receiving their antihypertensive medication and initiated an order for the metoprolol tartrate (United States Pharmacopeia, 2005)

These stories illustrate the ongoing medication-related problems inherent during care transitions that have been established in the literature. Medication discrepancies frequently occur during care transitions from hospital to home, with studies estimating anywhere from 14.1% to 94% of patients experiencing at least one medication discrepancy (Coleman et al., 2005; Corbett et al., 2010). These medication discrepancies have the potential to lead to adverse drug events (ADEs) and patient harm. An examination of 15 articles related to medication reconciliation and unintentional medication discrepancies present at admission to, or discharge from a hospital, found that 14.7% to 66.2% of discrepancies had the potential to cause patient harm (Michel et al., 2013). Many of the adverse events that

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occur in home healthcare are because of medication errors (Romagnoli et al., 2013).

Medication reconciliation has been recognized as a key strategy for addressing medication discrepancies and ensuring patient safety during care transitions. The Joint Commission (2006) defines medication reconciliation as:

> the process of comparing a patient's medication orders to all of the medications that the patient has been taking. This reconciliation is done to avoid medication errors such as omissions, duplications, dosing errors, or drug interactions. It should be done at every transition of care in which new medications are ordered or existing orders are rewritten.

In addition, medication reconciliation is a key part of the 2014 Home Care National Patient Safety Goals, contained within National Patient Safety Goal 3, and is a National Quality Forum National Voluntary Consensus Standard for Medication Management (National Quality Forum, 2010; The Joint Commission, 2014).

Beyond meeting regulatory requirements, medication reconciliation is a key process in home healthcare. Home healthcare providers serve a crucial role in the postacute setting, being the primary providers responsible for helping patients remain healthy enough to receive care in their own homes, enhance patient self-care and

self-management of their medical conditions, and reduce patient visits to emergency departments and unplanned hospital admissions (American Society of Health-System Pharmacists & American Pharmacists Association [ASHP & APhA], 2013; Romagnoli et al., 2013). Home healthcare providers have unique perspectives into the daily needs of patients in the continuum of care from inpatient settings to outpatient primary care settings to the home setting. This framework is critical as home healthcare patients often have multiple comorbidities and require multiple healthcare providers (e.g., primary care provider, specialist, home healthcare provider) to effectively manage their conditions, making medication reconciliation in the home healthcare setting crucial for ensuring patient safety and producing optimal health outcomes (Vaidya et al., 2012). The purpose of this article is to provide a summary of the evidence related to medication reconciliation with implications for home healthcare providers.

Key Barriers to Medication Reconciliation

Numerous barriers continue to inhibit effective medication reconciliation in home healthcare. This section provides an overview of key barriers.

Poor Information Transfer Across Settings

As patients transition between various care settings, there is often inadequate transfer of necessary patient information between facilities (Romagnoli et al., 2013). This information disconnect can be caused by factors such as lack of a standardized form describing the patient's current status and medications and poor communication between discharging and receiving facilities (Bowles et al., 2010; Bruning & Selder, 2011; Fuji et al., 2013). This can lead to inaccurate, outdated, or even missing information about a patient's medical history and medications, which inhibits the ability of home healthcare providers to accurately assess the appropriateness of a medication regimen (Fuji et al., 2013). For example, a study conducted by Bowles et al. (2010) examined the use of evidence-based disease management guidelines in home healthcare for patients with heart failure and diabetes. Their study found that 58% of heart failure patients were not on an angiotensin-converting enzyme (ACE) inhibitor, and that more than 41% of these patients did not have a documented justification for this lack of treatment.

Lack of Patient Knowledge and Engagement

Compounding this problem is the lack of patient knowledge about his or her health, with patients often unable to provide accurate information about their current medication regimen to their healthcare providers (Bowles et al., 2010; Fuji et al., 2013; Romagnoli et al., 2013). This may be especially difficult in the home healthcare setting, where providers may not have ready access to patient medical history and medication information and must rely on the patient to provide much of this information.

Mandated Behavior Versus Importance of Medication Reconciliation

It has been suggested that because of regulatory requirements, the focus of medication reconciliation is sometimes on completion of forms rather than the overall purpose and benefit of the process to patients (Institute for Healthcare Improvement [IHI], 2011). There may not be recognition from providers that medication reconciliation is more than simply identifying discrepancies when they occur; rather it is a strategy to help positively impact patient outcomes such as hospitalization rates, ADEs, quality of life, patient knowledge, and self-efficacy (Frey & Rahman, 2003). Lack of this understanding can lead to steps in the process being skipped or rushed through (IHI, 2011).

Lack of Role Clarity

Home healthcare nurses are pivotal in advocating for and ensuring patient safety during care transitions. They are often the providers tasked with performing medication reconciliation in the home care setting and are expected to collaborate with patients, families/caregivers, and other healthcare providers in this process (Ellenbecker et al., 2008). However, this role is not always well defined and well communicated to other home healthcare providers. Lack of role clarity among the home healthcare team may lead to gaps in care such as medication reconciliation not being completed and medication discrepancies remaining unaddressed (IHI, 2011).

Ensuring Effective Medication Reconciliation

To address these barriers to medication reconciliation, numerous strategies can be implemented to ensure effective medication reconciliation is completed. Each of these strategies is described with a summary provided in Table 1.

Establish a Standardized Process for Medication Reconciliation

Home healthcare nurses are pivotal in advocating for and ensuring patient safety during care transitions.

Home healthcare agencies should establish a standardized process for medication reconciliation (Barnsteiner, 2008). End-users such as nurses, physicians, pharmacists, and other healthcare providers involved in medication reconciliation should be the primary individuals involved in this decision making (IHI, 2011). Roles and responsibilities should be identified for each provider involved, and formalized through policies and procedures (Agency for Healthcare Research and Quality [AHRQ], 2012; Barnsteiner, 2008). For example, nurses may be primarily responsible for medication reconciliation, pharmacists may provide as-needed consultation and recommendations for optimization of medication therapy, and physicians may be responsible for the final decisions on how to best address medication discrepancies when they arise, and document justification for changes in the medication therapy.

Although it is important to recognize that no single process will meet the needs of all patients, the IHI (2011) suggests the following steps be formally implemented: set a timeframe for medication reconciliation completion; specify when medication reconciliation should occur; and develop checklists and forms as needed to guide providers through the process. This can be started by establishing a flowchart with each step of the medication reconciliation process, including how this process fits into the larger workflow of each provider (AHRQ, 2012).

Once these steps are completed, agencies should provide a training program to all providers involved in medication reconciliation in order to ensure that everyone understands the process and can complete it as intended (ASHP & APhA, 2013; Barnsteiner, 2008). Agencies may consider linking medication reconciliation to other organizational strategic goals to emphasize the importance of the process and get all providers on board (AHRQ, 2012).

Information to Document During Medication Reconciliation

In addition to the information specified in The Joint Commission's medication reconciliation safety goal, home healthcare providers should document the following: both prescription and nonprescription medications; medical conditions; patient allergies and dietary habits; and contact information for healthcare providers (IHI, 2011).

Develop a Plan for Addressing Medication Discrepancies

Policies and procedures should be developed for documenting and addressing discrepancies that arise during medication reconciliation. Frey and Rahman (2003) provide an interprofessional approach for this process, described in detail in Table 1.

Evaluate the Effectiveness of Medication Reconciliation

Once the medication reconciliation process has been formalized, there is a need to assess the effectiveness of the process on a regular basis (Barnsteiner, 2008). There are a few suggested mechanisms for conducting this evaluation (IHI, 2011). All home healthcare providers involved in medication reconciliation can be interviewed to assess their understanding of the process overall and their role in the process. Providers can be asked to talk through each step of the process, their responsibilities within that step, and the purpose of the step. Steps that are missed or misunderstood may need to be revisited. Alternatively, a random chart review can be conducted to determine the proportion of unreconciled medications. This can be calculated by taking the number of unreconciled medications and dividing it by the total number of medications. These evaluations may reveal weak points in the process that require education or other changes to ensure that medication reconciliation is working as it was designed to work. The IHI has a model for improvement using the "Plan, Do, Study, Act" framework that can be used for quality improvement initiatives in the area of medication reconciliation (IHI, 2011).

Emphasize the Importance of Interprofessional Care

Interprofessional collaboration and teamwork both within the home healthcare agency and also

Table 1. Strategies for Improving Medication Reconciliation

Strategy	Specifics
Establish a standardized process	Identify all providers involved in medication reconciliation and what their specific responsibilities are. These should be formalized through policies and procedures. Set a timeframe for medication reconciliation to be completed on patient transition to home care. Conduct medication reconciliation any time there are changes to a patient's medication regimen (e.g., a new medication is started, an existing medication is discontinued, the dose of a medication is changed, or the frequency of a medication is changed). Develop checklists and scripts to guide the medication reconciliation process and ensure that each step is completed (e.g., medication interview script, forms to indicate that the medication record was reviewed and reconciliation was completed). Create a flowchart of the medication reconciliation process. Multiple flowcharts may be necessary depending on what setting the patient is transitioning from. Provide education and training to all providers involved with medication reconciliation on the established steps.
Information to document during medication reconciliation	All prescription medications, over-the-counter medications, herbal products, and vitamins should be included in the medication list. Match each item on the medication list to a documented medical condition. Maintain a comprehensive list of patient allergies and dietary habits that can impact medication efficacy (e.g., leafy green vegetables and warfarin). Indicate the source for each piece of information (e.g., patient self-report, pharmacy record, primary care provider record). Record the name, address, and phone number for all of the patient's healthcare providers.
Develop a plan for addressing medication discrepancies	The home healthcare nurse should work with a pharmacist (typically a home healthcare pharmacist, although the patient's community pharmacist may be appropriate if the agency does not employ a pharmacist) to review the medication regimen and develop a care plan. The nurse should collect additional information about the discrepancy, as needed during the next home visit. The pharmacist should provide recommendations for how to best address the discrepancies. The nurse and/or pharmacist should contact the prescribing physician to address the discrepancy, present the new care plan with suggested medication changes, and obtain follow-up orders. Reasons for the change should be documented in the medication chart. The nurse should help the patient with the medication changes and monitor the need for follow-up.
Evaluate the effectiveness of medication reconciliation	Develop mechanisms to evaluate medication reconciliation on an ongoing basis. Determine how often these evaluations will occur. Evaluation mechanisms can include provider interviews to assess understanding of their roles and responsibilities within the process, or chart reviews to calculate a proportion of unreconciled medications. Although strategies to address problems will differ based on each agency, the IHI has a Model for Improvement that can provide a framework for developing these strategies. Make changes as needed to the medication reconciliation flowchart once strategies have been implemented to address identified problems.
Emphasize the importance of interprofessional care	Use pharmacist expertise as needed during medication reconciliation. They may be particularly useful for high-risk patients such as those taking a large number of medications, who are elderly, and who are taking medications with a narrow therapeutic index. Identify a primary contact person at other organizations who can serve as a resource when information about a patient is missing, incomplete, or inaccurate.
Engage patients/ caregivers	Educate patients about the importance of medication reconciliation and the impact it has on ensuring safe and high-quality patient care. Encourage patients to keep track of their own medications and introduce them to various tools such as PHRs, patient portals, and paper-based records that can help them do so. Ask patients to have their medication list and/or their medications present at each visit. Provide patients with the reconciled medication list. Remind patients to share their up-to-date medication list with all of their healthcare providers.

with external providers and organizations are key to effective medication reconciliation (AHRQ, 2012; ASHP & APhA, 2013). Although nurses may be the primary provider responsible for medication reconciliation in the home healthcare setting, access to pharmacist expertise (primarily within the home healthcare agency but also in the community setting) can help enhance this process by providing complementary expertise to nurses' role in direct patient care (Vogelsmeier et al., 2013). Pharmacist integration into medication reconciliation processes have been effective at decreasing hospitalizations from home healthcare settings, and it has been suggested that physicians may be more receptive to medication change suggestions coming from a pharmacist compared to a nurse (Frey & Rahman, 2003; Reidt et al., 2014). Although cost may be a barrier to a pharmacist being on staff within a home healthcare agency, studies have demonstrated that cost savings resulting from use of a pharmacist may mitigate this concern (ASHP & APhA, 2013; Frey & Rahman, 2003; Myrka et al., 2011). Each home healthcare agency should identify when pharmacist expertise and intervention will be used (e.g., when evaluating high-risk patients such as those who are older, taking large numbers of medications, or taking medications with a narrow therapeutic index) (ASHP & APhA, 2013; IHI, 2011).

Additionally, there is much benefit to cultivating relationships with healthcare providers and care settings that patients frequently transfer to and from (IHI, 2011). This relationship-building can lead to standardized forms being developed and used across settings, or at a minimum, streamlined communication for as-needed consultations and clarification of information (ASHP & APhA, 2013). Home care providers can begin this relationship by regularly transmitting a reconciled list of medications to the patient's primary care provider and community pharmacist (ASHP & APhA, 2013).

Engage Patients/Caregivers

Patients play a pivotal role in medication reconciliation. Patients that are knowledgeable about their own health and the medications they are taking are better equipped to be active participants in the medication reconciliation process. Patient participation in medication reconciliation increased when: (a) they were provided with reminders before a visit asking them to bring an updated list of their medications (or to have available all of their current medications for inspection); (b) the importance of this was reinforced by nurses; and (c) a printout of the reconciled medication list was provided to patients (IHI, 2011; Nassaralla et al., 2009). Patients should be educated about how medication reconciliation improves the quality and safety of their care, and the important role that they play in the process (AHRQ, 2012). Patients should be encouraged to keep track of their own medications, make sure their list is updated on a regular basis, and share this list with all of their healthcare providers (IHI, 2011). Patients should be introduced to record-keeping tools such as online personal health records (PHRs) and patient portals (often available through their primary care provider) (Tang et al., 2006). For those patients who do not want to engage in electronic record keeping, they can be referred to paper-based resources such as "My Medicine List" developed by the American Society of Health-System Pharmacists (http://www.safemedication.com/safemed/MyMedicineList.aspx).

Electronic Health Record Adoption and Use

As electronic health record (EHR) adoption and use increases nationally because of the financial incentives of the meaningful use program, information sharing can be more effectively facilitated through home healthcare use of an EHR. Use of an EHR can enhance communication between home healthcare providers and also provide access to outside providers' information. Having a more complete picture of patients' medical conditions and current medications can greatly facilitate effective medication reconciliation practices (ASHP & APhA, 2013; Sockolow et al., 2014). In addition, the integration of information collected by home healthcare providers can fill an important information gap that is typically not obtained by any other healthcare provider (Ruggiano et al., 2013). However, only 44% of home healthcare and hospice agencies have adopted an EHR (Bercovitz et al., 2013). Part of the reason for this low adoption rate could be attributed to the fact that home healthcare providers are not eligible for the meaningful use program (Ruggiano et al., 2013). There is a need for policy changes that would allow home healthcare agencies and providers to participate in federal health information technology incentive programs. Policymakers can use the home healthcare meaningful use framework established by Sockolow et al. (2011) as a starting

point for ensuring home healthcare is involved in EHR adoption and use incentive programs.

Conclusions

Medication reconciliation remains an important process to ensure patient safety and quality of care across care settings. Although numerous barriers remain that inhibit the optimization of medication reconciliation, developing a standardized process, evaluating the process on an ongoing basis, forming internal and external interprofessional relationships and teams, and engaging patients and caregivers to be more knowledgeable about their health and medication use can ensure effective medication reconciliation. ☗

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