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Pharmacist interventions throughout care transitions: a review of current practices

Julie A. Testman[1], Anne E. Teichman[1], Stephen J. Cook[1], Angel Kimble[2], Brittany L. Riley[1], Jessica Robinson[1], Brittany Snodgrass[1]

[1]*Department of Pharmacy Practice, University of Charleston School of Pharmacy, Charleston, West Virginia, United States*
[2]*Department of Pharmacy Practice, Administration and Research, Marshall University School of Pharmacy, Huntington, West Virginia, United States*

ABSTRACT

Transitions of care occur each time a patient moves from one healthcare provider or care setting to another. Challenges that have been identified include: failure of the patient to keep appointments for outpatient chronic care; inability for smooth transfer of information between various healthcare providers; and failure to find appropriate placement for patients who can no longer manage independent living. As pharmacists representing an array of practice settings, these authors here present the models of contributions made by pharmacy services within such multifaceted approaches. An initial literature search was conducted using the National Library of Medicine via PubMed. Studies conducted in the United States that included at least one pharmacy service within the methods of intervention were selected for review. Where there are published findings from each setting, we include the measured impact, if reported. Although pharmacists represent the most skilled healthcare professionals in medication reconciliation and management, the best processes for tapping that expertise have yet to be fully elucidated. We present this review of current practices with the continued hope that the pharmacy profession will, not only continue to be the quiet patient advocate for best medication use, but also to open our minds to the need to measure, adjust, and measure again, the systems and processes we use to best integrate our knowledge for the overall benefit of the patient.

***Key Words*:** Clinical pharmacy, transitions of care, medication reconciliation, continuity of care, patient transfers.

INTRODUCTION

The decade of cost containment by focusing on reducing "Length of Stay" produced phenomenal improvements in infectious disease by reducing the warehousing of chronically ill patients next to acutely infectious patients in United States (US) hospitals. Yet cost per capita in the largest industrialized nation continues to outpace all others, while outcomes stagnate. This focus on Length of Stay (LOS) reduction led to the evolution of the "hospitalist" specializing in addressing the patient's acute needs in the most efficient manner possible to return the patient to his or her usual life (Peterson, 2009).

While the majority of patients are well served by this model, the minority of chronically ill and unstable patients have overwhelmed US healthcare facilities with repeated inpatient admissions designed only to address acute problems. For this section of the population, the specialized hospitalist system may have led to an even greater fragmentation of care services. Challenges that have been identified include: failure of the patient to keep appointments for outpatient chronic care; inability for smooth transfer of information between various healthcare providers; and failure to find appropriate placement for patients who can no longer manage independent living (Hansen *et al.*, 2011). Some have argued that the process of separating inpatient care from the outpatient primary care provider is responsible for this fragmentation (Anderegg *et al.*, 2013). Others observe that increasing reliance on electronic medical records which are incompatible with each other has hampered the smooth flow of information as patients' transition through various care settings (Freund *et al.*, 2013).

***Corresponding Author**:
Julie A. Testman, Associate Professor
University of Charleston School of Pharmacy
2300 MacCorkle Avenue Southeast
Charleston, West Virginia (United States) 25304
E-mail: *julietestman@ucwv.edu*
Contact No.: 1-304-357-4918

Collectively, these have been labeled as "transitions of care" (TOC) challenges. Transitions of care occur each time a patient moves from one healthcare provider or care setting to another. Many features of the care process that may improve the experience of both care providers and patients have been studied; however none of these features has shown independent success (Hansen *et al.*, 2011). Thus the Institute for Healthcare Improvement STate Action on Avoidable Re-hospitalizations (STAAR) Initiative has consistently recommended the coordination of a multifaceted approach using several care improvement methods together. Selection of methods is based on the specific strengths of the facilities providing care or the patients in need. While no single solution has been identified, all descriptions of the various challenges have included reference to problems caused by avoidable medication errors. Examples of such errors include: patient confusion when a home medication is discontinued, yet not removed from the home; inadvertent discontinuation of chronic medications upon admission to inpatient care; and drug-drug interactions between previously prescribed and new medications (Hansen *et al.*, 2011).

As pharmacists representing an array of practice settings, these authors here present the models of contributions made by pharmacy services within such multifaceted approaches. Leaders in patient care coordination and in pharmacy need to be aware of the potential to use pharmacists to improve the patient experience of transitioning between healthcare settings. Where there are published findings from each setting, we include the measured impact, if reported.

METHODS

An initial literature search was conducted using the National Library of Medicine via PubMed (Figure 1). The authors supplemented this search through examination of the referenced literature within the documents applicable to each specific setting of results, including: discharge from emergency departments; internal hospital transfers;

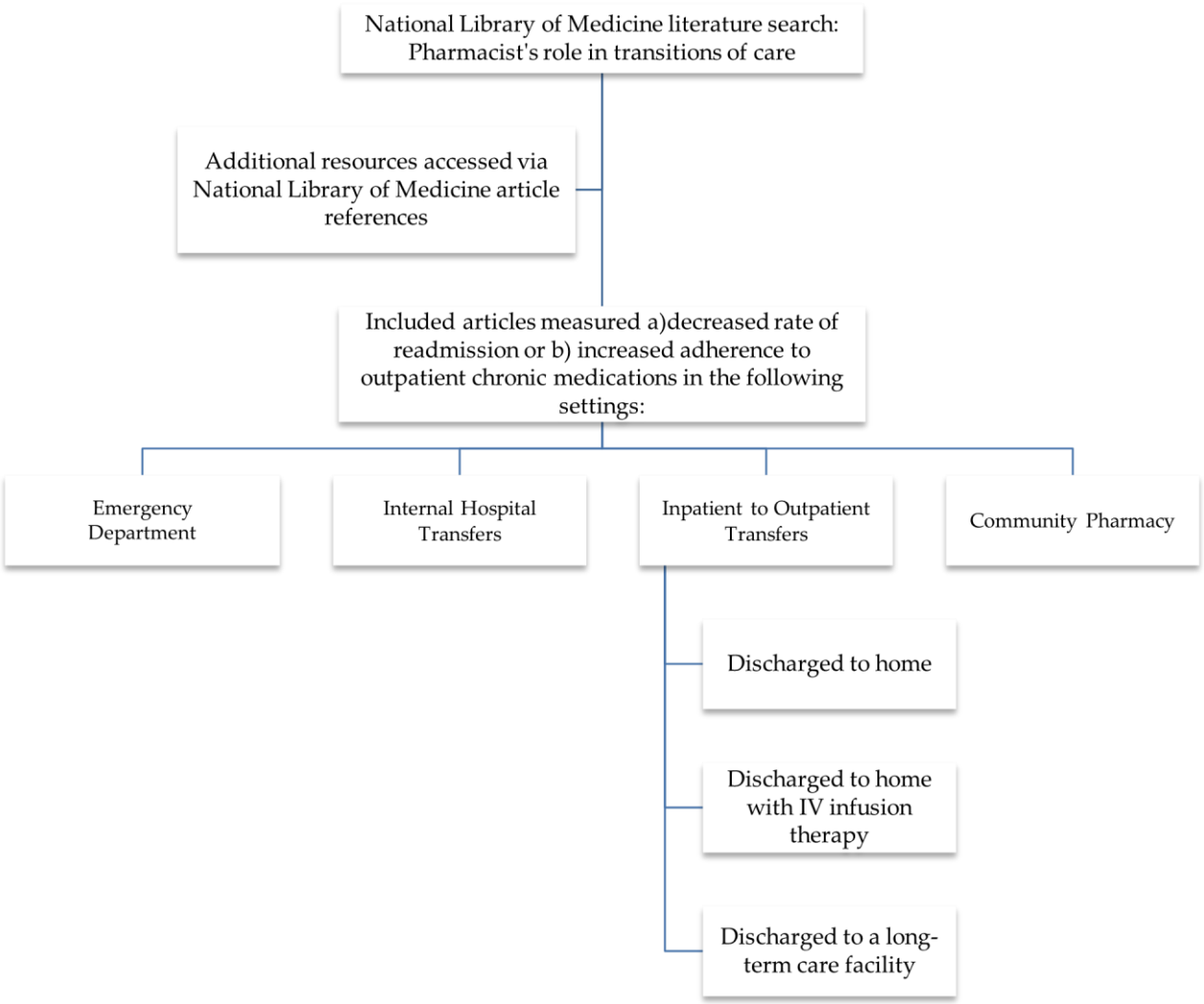

Figure 1: Literature Search Methods

inpatient-to-outpatient transfers (discharge to home, discharge to home with intravenous infusion therapy, discharge to long-term care facilities); and the community pharmacy. Studies conducted in the United States that included at least one pharmacy service within the methods of intervention were selected for review. Selected articles included at least one measure of either decreased rate of re-admission for inpatient care or increased adherence to outpatient chronic medications likely to decrease hospital readmission. Each article was initially reviewed by a content expert familiar with the patient care setting relevant to the publication. A summary of study design and findings was provided to the author team for further clarification and to eliminate duplicate inclusion of data. If a publication was found to apply to more than one care setting, the lead author determined only one setting for inclusion in this review. Published findings from each setting were evaluated for pharmacy services studied and the measured impact, if reported.

RESULTS AND DISCUSSION

Discharge from emergency departments

In the US there are approximately 114 million emergency department (ED) visits each year. Studies have shown that 70% of adverse events originate from care received in the ED and medication errors make up the majority of these adverse events (Institute of Medicine, 2007). The case of Mr. John Doe can help one to understand some of the reasons for these medication errors.

Four days ago, Mr. John Doe presented to the ED with complaints of urinary urgency and dysuria. He was diagnosed with a urinary tract infection, given a prescription for sulfamethoxazole/trimethoprim, and discharged home. He is now in the intensive care unit (ICU) with a gastrointestinal bleed. Review of his medical records revealed that Mr. Doe has been taking warfarin for atrial fibrillation for 5 years; his dose was not adjusted when sulfamethoxazole/trimethoprim was added. Mr. Doe did not have an appointment with the anticoagulation clinic

for 5 weeks following ED discharge. How could this situation have been avoided? Simply, improvements in the TOC methods used when caring for patients discharged to home from the ED.

As the case above demonstrates, transitioning from the ED to home provides many opportunities for adverse events to occur. Sharma *et al.* (2012) found an alarming rate of 3.3 discrepancies per patient when initial medication lists obtained in one ED were compared to medication lists obtained through telephone interview seven days later. It is impossible to ensure a safe discharge from the ED when home medication lists are inaccurate. In a survey of ED nurses, 1 of 5 major issues identified in caring for elderly patients involved the TOC process. Incomplete information, unsafe plans for discharge, and ineffective communication were cited as reasons for TOC errors (Boltz *et al.*, 2013).

Unfortunately, no single method has been identified to improve TOC outcomes upon ED discharge and further study regarding the pharmacist's role is needed. One study evaluated the implementation of standardized computerized discharge instructions with medication reconciliation and did not find a difference in readmissions or 30-day return ED visits (Showalter *et al.*, 2012). The survey of ED nurses previously discussed recommended placement of ED based social workers or case managers to assist with discharge (Boltz *et al.*, 2013). Kesslar *et al.* (2013) recommended six key elements of communication for all TOC as follows:

Key Elements of Communication for all TOC Models (Kessler *et al.*, 2013):

1. Communication between the sending and receiving clinicians including:
   a. Summary of care given
   b. Patient's goals of care
   c. Updated problem list
   d. Baseline mental and physical function
2. Preparation of the patient and caregiver for what to expect at the next site of care.
3. Reconciliation of the patient's medications prescribed before the initial transfer with the current regimen.
4. A follow-up plan for how outstanding tests and appointments are completed.
5. An explicit discussion with the patient and/or caregivers regarding warning symptoms.
6. Updated contact telephone numbers for all parties.

Although information is lacking in regard to the pharmacist's role in caring for patients transitioning from the ED to home, pharmacists do offer a potential source for meaningful and sustainable improvements. Patient counseling performed by pharmacists has contributed to positive outcomes following inpatient-to-home discharges (Sarangarm *et al.*, 2012); it is reasonable to expect similar outcomes for patients transitioning from the ED to home.

Internal hospital transfers

Mr. Doe has stabilized and appears to be ready for transfer from the ICU to the Medicine Service. Medication errors are common when transitioning between levels of care within hospitals and are expected to be similar to those observed during inpatient-to-outpatient transfers: omission, incorrect dose or frequency, therapy duplication, etc. (Santell, 2006). The pharmacist's role in internal hospital transfers is not well defined or studied.

Lee *et al.* (2010) performed a prospective evaluation of medication discrepancies upon unit transfers. This study evaluated a common US practice model that requires all medications to be discontinued when transferring from one medical unit to another. When the patient arrives at the new unit, the medication reconciliation process is performed similarly to that of a new admission. In the study, pharmacists completed a comprehensive medication review to determine the most accurate medication list. Results revealed that 36.4% of patients had at least one unintentional discrepancy "with the potential to cause discomfort and/or clinical deterioration". This study was not designed to assess the impact of pharmacist interventions on outcomes; however, it may demonstrate potential value for pharmacists in the transfer medication reconciliation process.

Pharmacists play a key role to ensure appropriate continuation of critical or unfamiliar therapies throughout internal hospital transfers. To the authors' knowledge there are no published studies within the US that evaluate pharmacist involvement in this process, despite its common practice. A single center study from Australia evaluated pharmacist impact on errors and omission rates and timely administration of oncology and hematology therapies for patients transferred to ICUs (Coutsouvelis *et al.*, 2010). The results of this study showed that a clinical pharmacist providing written and oral information to ICU staff decreased therapy errors and omissions ($p<0.0001$) and increased timely therapy administration ($p<0.0001$). While these findings were statistically significant, a limiting factor to this study was its small sample size of 55 patients. A larger multicenter study may provide a better understanding of the clinical and economic impact of pharmacist involvement in this care environment.

Inpatient-to-outpatient transfers

Patients are discharged from inpatient hospitalizations to various environments and levels of care. Some may be discharged home to manage their medications and health conditions independently or with the assistance of family or informal caregivers. Those who require a long period of intravenous (IV) therapy may be discharged from the hospital to home with IV infusion therapy management. Among patients 65 years and older, transitions to long-term care (LTC) facilities occur often. The sections that follow will address the pharmacist's role during these transitions.

Discharged to Home

Multiple studies have been conducted evaluating medication reconciliation at discharge in regard to unintentional discrepancies, adverse events, and 30-day re-hospitalization rates. Pharmacists are commonly involved in performing medication reconciliation; however, benefits are typically observed when multiple interdisciplinary TOC interventions are performed collaboratively (Kwan *et al.*, 2013). Jack *et al.* (2009) evaluated the effect of a reengineered hospital discharge (RED) program on readmissions in patients discharged to home from a medical teaching service. Pharmacists worked with nurse discharge advocates (DAs) to coordinate discharge, educate patients, and reconcile medications. DAs were trained to coordinate inpatient aspects of the RED program and create an after hospital care plan (AHCP) for patients in the intervention group; copies were faxed to the patients' primary care providers. Components of the AHCP are as follows:

Reengineered Hospital Discharge (RED) Program: After Hospital Care Plan (AHCP) (Jack *et al.*, 2009):

1. Contact information for medical provider
2. Dates for follow-up appointments and tests
3. Appointment calendar
4. Color-coded medication schedule
5. Tests with results pending at discharge
6. Description of discharge diagnosis
7. Instructions for actions to take if problems occur

Pharmacists telephoned patients 2-4 days after discharge. A scripted interview process was used to reinforce information provided by the DA and the patients' medications were reviewed for potential problems. Sixty-percent of patients in the intervention group were contacted post-discharge (median of 4 days); medication reviews were completed for 53% of intervention participants. Estimated weekly pharmacist time to provide this service for 14 patients per week was 6.1 hours (approximately 0.15 full-time equivalents). For the primary outcomes of ED visits and hospitalizations within 30 days of discharge, rates for patients in the intervention group were lower than the usual care group (incidence rate ratio, 0.695 [95% CI, 0.515 to 0.937]; *P = 0.009).* Because this study only evaluated the impact of the comprehensive RED program, the degree to which pharmacist-initiated telephone calls impacted the primary outcome measures could not be determined.

The Pharmacist Intervention for Low Literacy in Cardiovascular Disease (PILL-CVD) Study randomized 862 participants to either a pharmacist intervention group with in-hospital, discharge, and post-discharge components (n = 430) or a usual care group (n = 432). Medication reconciliation and counseling were provided at discharge for the intervention group; unintentional discrepancies were communicated to the inpatient team for resolution and patients were provided with a comprehensive discharge medication list. A study coordinator telephoned patients 1-4 days after discharge; clinically important findings were referred for pharmacist review (Schnipper *et al.*, 2010).

The effect of these interventions on clinically important medication errors occurring within 30 days after discharge was evaluated by Kripalani *et al.* (2012) in an intent-to-treat analysis that included 851 patients (7 intervention and 4 usual care patients withdrew consent or died in the hospital). Four hundred thirty two patients (50.8%) experienced one or more clinically important medication errors within 30 days of discharge. Differences in mean clinically important medication errors were not statistically significant between treatment groups, highlighting the difficulty of improving medication safety during the transition from hospital to home. Generalizability of results should be considered based on pre-existing hospital resources and study participant characteristics.

Discharged to Home with IV Infusion Therapy

While the average LOS for many patients has significantly decreased, the need for long-term IV infusion therapy has not. This presents an interesting new angle to "home care" since the patient or family member must now administer IV medications traditionally given only in hospital or outpatient infusion clinics. Common medications or therapies administered in this setting include antimicrobial agents, total parenteral nutrition (TPN), chemotherapy, and fluid therapy. The American Society of Health-Systems Pharmacists (ASHP) developed guidelines for the pharmacist's role in home care in 2000. These guidelines outline steps required to ensure appropriate TOC from hospital to home and include: selection of products and devices; development of a comprehensive care plan; patient education and counseling; clinical monitoring; and monitoring and reporting of adverse drug reactions (American Society of Health-System Pharmacists, 2000). Unfortunately, research on the impact pharmacists may have on this TOC is scarce in the US, and even world-wide.

Outpatient parenteral antimicrobial therapy (OPAT) is becoming more common for treatment of complicated infections requiring long-term IV therapy. The Infectious Diseases Society of America (IDSA) developed guidelines for OPAT that stress the importance of a multidisciplinary team to ensure successful therapy completion. They suggest the role of the pharmacist include pharmacokinetic monitoring for aminoglycosides, vancomycin, and teicoplanin to ensure safety and efficacy (Tice *et al.*, 2004). Heintz *et al.* (2011) examined the impact of an Infectious Diseases (ID) trained pharmacist led OPAT team. The pharmacist was responsible for ensuring appropriate antimicrobial selection and monitoring parameters in consultation with an ID physician. In a total of 644 consults, the pharmacist made interventions involving safety (56%), regimen complexity (41%), and efficacy (29%) that resulted in a net cost savings of approximately $400,000. While this study did not measure clinical outcomes of the OPAT program, it provides support for the potential positive impact of a pharmacist-led team.

Kumpf and Tillman (2012) reviewed the TOC of patients on TPN from hospital to home and also emphasized the importance of a multidisciplinary approach. The authors suggested that all team members, including the pharmacist, should be trained and experienced in the development and maintenance of TPN. Unfortunately, there is little evidence to support this statement. Even though guideline authors routinely support the involvement of pharmacists in the TOC from hospital to home IV infusion therapy, scant evidence exists, indicating a need for future research in this area.

Discharged to Long-Term Care Facilities

Elderly patients are classified as "at-risk" when transferred from inpatient hospitalizations to LTC facilities (American College of Clinical Pharmacy *et al.*, 2012). Older adults access the healthcare system disproportionately and are at increased risk for adverse drug events (ADEs) during care transitions. Risk factors for ADEs among nursing home residents include multiple medical conditions and multiple medications, particularly psychoactive, opioid, and anti-infective drugs (Field *et al.*, 2001). Coleman *et al.* (2003) stated that the ingredients for effective TOC for LTC residents should include a comprehensive plan and mechanisms to ensure that skilled LTC health practitioners receive pertinent medical information regarding the resident's clinical status, preferences, and goals.

Pharmacists can intervene to provide and improve evidence-based medication management for elderly patients. One randomized, controlled study conducted by Crotty *et al.* (2004), demonstrated improvements in Medication Appropriateness Index (MAI) scores when pharmacists were involved as transition coordinators for patients moving from the hospital to a LTC facility. Chabbra *et al.* (2012) published a systematic literature

review evaluating studies aimed at performing medication reconciliation interventions in patients transferred to and from LTC settings. Seven studies met the inclusion criteria and each one demonstrated that specific pharmacist intervention methods for medication reconciliation resulted in improvements within the outcome(s) evaluated. The authors of this review recognized the need for additional well-designed studies to effectively evaluate the impact of pharmacist interventions on medication reconciliation processes in LTC transitions.

Role of the community pharmacist

When discussing TOC models, a critical player in the continuum of care is often overlooked: the community pharmacist. Community pharmacists represent the first healthcare providers many patients come in contact with following hospital discharge. As such, they have the potential to positively impact clinical and economic outcomes through medication reconciliation and medication therapy management services (MTMS). One study found that 86% of patients filled prescriptions within 30 days of hospital discharge. In this study, initial pharmacy claims were often made within 6 days of discharge and occurred prior to outpatient follow-up appointments (Roughead *et al.*, 2011).

MTMS are currently provided at a large number of US community pharmacies and include five core elements: (1) medication therapy review (either targeted or comprehensive); provision of (2) a personal medication record, and (3) a medication-related action plan (MAP) to the patient; (4) intervention and referral as needed; and (5) documentation and follow-up (American Pharmacists Association and National Association of Chain Drug Stores Foundation, 2008). These services are frequently offered to certain high-risk patient populations, including those experiencing care transitions. Challenges exist in TOC interventions within the community pharmacy setting. Unless the pharmacy is linked with the acute care facility, the transfer of health information lacks any formal structure. Freund *et al.* (2013) studied community pharmacist conducted medication reconciliation after hospital or LTC facility discharge. Medication lists were requested to be faxed to the pharmacy but were often not received. Lack of access to these lists was the most frequently cited barrier (24%).

With reimbursement penalties looming, many US hospitals are looking for avenues to improve discharge processes. Community pharmacists are providing assistance with medication-related issues during care transitions (Institute for Safe Medication Practices, 2012). Interventions include delivery of medications, counseling at the bedside, and discharge follow-up via telephone or home visits. While no published research has yet identified an improvement in patient outcomes with these services, there is ample evidence that failure to receive newly prescribed medications leads to hospital readmissions.

CONCLUSION

Although pharmacists represent the most skilled healthcare professionals in medication reconciliation and management, the best processes for tapping that expertise have yet to be fully elucidated. While we appreciate surrogate markers of quality healthcare, such as reduced LOS or improved MAI scores, these alone have not led to an improvement in the integration of the pharmacist's skills with the rest of the healthcare team. MTMS are often disconnected from the comprehensive patient care process due to poor communication and lack of mutual understanding between the pharmacist & primary care provider.

The event of a TOC provides a unique opportunity for the healthcare team to rally together in order to best address the patient's needs as a unified whole. These moments are indeed rife with change, not just in the patient's primary setting, but also with a variety of changes in the goals of care and the processes available to reach them. We present this review of current practices with the continued hope that the pharmacy profession will, not only continue to be the quiet patient advocate for best medication use, but also to open our minds to the need to measure, adjust, and measure again, the systems and processes we use to best integrate our knowledge for the overall benefit of the patient.

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