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Improving Care Transitions: Current Practice and Future Opportunities for Pharmacists

American College of Clinical Pharmacy
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During the past decade, patient safety issues during care transitions have gained greater attention at both the local and national level. Readmission rates to U.S. hospitals are high, often because of poor care transitions. Serious adverse drug events (ADEs) caused by an incomplete understanding of changes in complex drug regimens can be an important factor contributing to readmission rates. This paper describes the roles and responsibilities of pharmacists in ensuring optimal outcomes from drug therapy during care transitions. Barriers to effective care transitions, including inadequate communication, poor care coordination, and the lack of one clinician ultimately responsible for these transitions, are discussed. This paper also identifies specific patient populations at high risk of ADEs during care transitions. Several national initiatives and newer care transition models are discussed, including multi- and interdisciplinary programs with pharmacists as key members. Among their potential roles, pharmacists should participate on medical rounds where available, perform medication reconciliation and admission drug histories, apply their knowledge of drug therapy to anticipate and resolve problems during transitions, communicate changes in drug regimens between providers and care settings, assess the appropriateness and patient understanding of drug regimens, promote adherence, and assess health literacy. In addition, this paper identifies barriers and ongoing challenges limiting greater involvement of pharmacists from different practice settings during care transitions. Professional degree programs and residency training programs should increase their emphasis on pharmacists' roles, especially as part of interdisciplinary teams, in improving patient safety during care transitions in diverse practice settings. This paper also recommends that Accreditation Council for Pharmacy Education (ACPE) standards include specific language regarding the exposure of students to issues regarding care transitions and that students have several opportunities to practice the skills needed for effective care transitions. Moreover, reimbursement mechanisms that permit greater pharmacist involvement in providing medication assistance to patients going through care transitions should be explored. Although health information technology offers the potential for safer care transitions, pharmacists' use of information technology must be integrated into the national initiatives for pharmacists to be effectively involved in care transitions. This paper concludes with a discussion about the importance of

recognizing and addressing health literacy issues to promote patient empowerment during and after care transitions.

Key Words: care transition, continuity of care, transition of care, medication reconciliation.

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Care transitions, also known as transitions of care, occur at many levels and across the entire spectrum of health care. Care transitions may be within health care systems, such as from the intensive care unit (ICU) to a general medical ward, as well as between health care systems, such as from a hospital to a long-term care facility (LTCF). Care transitions also occur between health care providers, as when a patient is referred to a specialist by his or her primary care provider or at shift changes during a patient's hospitalization.[1] Patient management during each transition has the potential for positive or negative effects on clinical outcomes. Although an adverse drug event (ADE) may occur at any time, ADEs are at greater risk of occurring during care transitions. The 2011 Joint Commission identified the need to "maintain and communicate accurate patient medication information" as a National Patient Safety Goal (NPSG).[2–6] The charge for the 2010 ACCP Public and Professional Relations Committee was to develop a paper describing the roles and responsibilities of pharmacists in ensuring optimal pharmacotherapeutic outcomes during care transitions.

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Background

Transitions to and from any care setting can be overwhelming for a patient as well as for his or her family and caregivers. Adverse patient outcomes have been documented within each type of care transition. Problems with transitions often begin at the point of entry into a health care facility and, if uncorrected, can lead to patient harm.[7] One of the first studies to identify errors during care transitions showed that 54% of hospital medication errors made by prescribers were attributable to errors made when ordering medications upon hospital admission.[8]

Moving between inpatient and outpatient settings is a routine part of patient care and is the transition most extensively studied to date. This type of transitioning has been associated with preventable readmissions to the acute care hospital as well as increased use of emergency departments. Many of these hospital readmissions and visits to the emergency department are drug related.[2, 4] A major study demonstrated that 20% of hospitalized Medicare beneficiaries had a readmission to the same hospital within 30 days and 34% within 90 days of discharge.[9] About one-half of all patients readmitted within 30 days had no intervening visit to their primary care provider between hospitalizations. The reasons for readmission varied, but a contributing factor was the development of ADEs caused by an incomplete understanding of home and discharge drug regimens.

Challenges in Care Transitions

Inadequate communication and insufficient care coordination are common challenges during care transitions. Poor communication between inpatient and outpatient providers, together with the lack of an effective communication infrastructure, contributes to poor patient outcomes.[10, 11] Direct communication about the discharge between inpatient physicians and the patient's primary care physician (PCP) has been estimated to occur in 3–20% of discharges, and

discharge summaries are available to the PCP at only 12–34% of the first follow-up office visits.[10]

Communicating discharge instructions to patients can also be improved. A standardized document for discharge instructions that accompanies a patient from one setting to another does not exist. Discharge instructions often lack crucial information, such as pending test results or a complete medication list, and may be difficult for patients to understand.[10] Patients are often discharged with unresolved medical issues, requiring an outpatient follow-up. Understanding the need for that follow-up and being able to coordinate it may be challenging for many patients. A study evaluating 693 hospital discharges found that 27.6% of patients were recommended for outpatient workups, although only one-third were actually completed.[12] At present, neither inpatient nor outpatient pharmacists have been routinely engaged in facilitating and improving the transition from hospital to outpatient setting.

Transitions among different ambulatory settings also present challenges to maintaining an accurate medication list.[13] The community pharmacist could serve a pivotal role in these transitions; however, pharmacies are often physically located away from medical centers or physician offices, and the pharmacist may not be viewed as a readily accessible member of the team. In addition, patient-related information may not be adequately communicated to the community pharmacist. This inadequacy applies to communication between the prescriber and the community pharmacist, as well as between different pharmacies. Information technology systems may not permit communication between pharmacy dispensing systems and electronic health records, even for community pharmacies associated with medical centers. Patients may also choose to go to more than one pharmacy, using insurance benefits at some pharmacies and cash for generic drugs at others. The community pharmacist may be limited to obtaining medical information directly from the patient and caregiver, relying on them to accurately convey what was discussed at discharge.

Transitions from home or an acute care hospital to a LTCF may be difficult because neither the pharmacist nor the physician responsible for a patient's care is at the site daily. Such transitions present challenges, especially when clarifying medication orders and trying to answer questions from the nursing staff providing the daily care. A pharmacist-provided medication regimen review (MRR) may be unavailable in assisted living facilities, placing patients or residents at risk of medication errors, adverse drug reactions, and unnecessary medication use after a hospitalization.

Care coordination and continuation remain common problems. For example, many hospitalized older patients are scheduled to have their care continued at home through home care services, which can present unique challenges.[14] However, many hospital clinicians overestimate the type of services available at home, and hospital pharmacists are often not involved in the discharge planning process for patients who will receive home care services. In addition, because of various misinterpretations of Health Insurance Portability and Accountability Act (the HIPAA) privacy regulations, essential information may not be transmitted appropriately to the home care provider.[14] Even more commonly, patients with several acute and chronic conditions may require many medical appointments after discharge and can be easily overwhelmed if care coordination is inadequate.

The most important challenge is the lack of one clinician or team overall with the ultimate responsibility for coordinating a patient's care across different settings. Newer models, however, such as the patient-centered medical home (PCMH) or the accountable care organization (ACO), emphasize care coordination.[15, 16] Yet although these models continue to evolve, better coordination is a critical factor in many care transitions, and pharmacists must have roles in these models.[17]

At-Risk Populations

All patients are at risk of experiencing an ADE during care transitions. Patient groups at increased risk include older adults, those with limited health literacy, individuals at the end of life, children with special health care needs, and patients who take more than five medications daily.[18] Individuals with cognitive impairment are also at risk, as are those with complex medical or behavioral health conditions, coexisting disabilities, and lower incomes; those newly admitted to LTCFs; and those who move frequently or are homeless.[18–22] Homeless or medically underserved individuals may have many primary care providers or none; these individuals may use the emergency department for primary care because of inadequate financial resources.[23]

National Initiatives and Models of Care

In April 2011, as part of the Affordable Care Act, the Partnership for Patients: Better Care, Lower Costs was announced as a public-private initiative to improve the quality of health care in the United States.[24] The initial primary goal was to reduce readmissions by 20% by 2013. Although this initiative was focused on reducing all causes of harm in the hospital setting, a priority was to decrease the risk of ADEs by 50% within the next 2 years. As part of this initiative, the Centers for Medicare & Medicaid Services (CMS) announced a new Community-Based Care Transitions grant program to assist in reaching these goals.[25]

The discharge process is the focus of many quality improvement initiatives. The Agency for Healthcare Research and Quality (AHRQ) has endorsed four goals to decrease preventable readmissions. These goals for every patient and/or caregiver are as follows. (i) Know what medication to take and be able to take it. (ii) Know the signs of danger and know whom to call if they occur. (iii) Have a prompt follow-up appointment and be able to keep it. (iv) Understand and be able to follow a self-care program. In 2009, more than 30 professional organizations; governmental agencies, including AHRQ; patient groups; and developers of performance measures created standards for the transition between inpatient and outpatient settings at the Transitions of Care Consensus Conference.[26] Care coordination has been identified as a priority area that would improve the quality of health care for many patients across different care settings.[27]

Care Transition Models

New care transition models are available, some of which are multi- or interdisciplinary, whereas others are more narrowly focused on medical or nursing practice, as described in Table 1.[28–39] One of the best-known models, Project Re-Engineered Discharge (RED), includes pharmacists as a key part of the team (see discussion in the following section).

Project RED

Developed by investigators at Boston Medical Center and Boston University, the AHRQ-funded Project RED evaluated strategies to improve the hospital discharge process by promoting patient safety and reducing readmission rates.[40] In their initial steps to reengineer the discharge process, investigators identified factors that could be modified to reduce adverse events and rehospitalizations.[41] These included, but were not limited to, (i) education about the diagnoses throughout hospitalization; (ii) coordination and education about follow-up appointments and home care needs as well as the provision of contacts for patients, especially for emergency requirements; (iii) confirmation of the medication plan and a review of this plan with the patient, including identification of potential ADEs; (iv) expedited transmission of the discharge summary to physicians, visiting nurses, and others accepting responsibility for patient care after discharge; (v) provision of a written discharge summary plan, details of which patients should verbally explain so that their understanding can be assessed and the information clarified; and (vi) telephone reinforcement of the discharge plan and problem solving 2–3 days after discharge.

The effects of Project RED were evaluated in a randomized trial of 738 patients who had been discharged from Boston Medical Center. Patients in the intervention group received education and a personalized instruction booklet from a nurse discharge advocate, who also completed medication reconciliation, arranged follow-up appointments, and provided the instruction booklet and discharge summary to the primary care provider. A pharmacist followed up with a telephone call to the patient 2–4 days after discharge. Patients in the control group experienced the regular discharge process. Patients in the intervention group had a 30% lower rate of hospital use, defined as rehospitalization and use of the emergency department in the first 30 days after discharge, than the control group ($p=0.009$). Patients in the intervention group were also more likely to identify their diagnosis, understand their medications, and follow up with their PCP.[42]

Resources

Table 2 summarizes several other initiatives nationally recognized for their excellence.[43] In addition, organizations such as the Institute for Healthcare Improvement[44] have resources for improving care transitions, including on the local level. Moreover, CMS has funded many projects for improving care transitions.[45]

Table 1. Care Transition Models to Improve Care Transitions

Model Name and Lead Investigator	Key Components of Model	Outcomes/Results
Better Outcomes for Older Adults Through Safe Transitions (BOOST)[28] Mark Williams, M.D., Society of Hospital Medicine	Project aim is to establish a national standard for discharge processes. Member organizations have access to the Resource Center, which provides guidance on identifying areas for improvement, implementing, and evaluating the changes made. This program encourages a dedicated multidisciplinary team, which also includes pharmacists, to focus on discharge education	Best practices will be collected from participating programs to develop national standards
Care Transitions Intervention[29, 30] Eric Coleman, M.D.	This is a self-management program provided for 4 weeks for patients with complex medical needs and their caregivers. They learn self-management skills from a Transition Coach during their transition from hospital to home. The four pillars of the model are (i) medication self-management; (ii) use of a dynamic patient-centered personal health record; (iii) timely primary care and specialty care follow-up postdischarge; and (iv) knowledge of red flags that indicate worsening in their condition and how to respond	Lower readmission rates for intervention patients vs controls at 30 (p=0.048) and 90 days (p=0.04) Lower readmission rates for same condition of index hospitalization at 90 (p=0.04) and 180 days (p=0.046). Anticipated annual cost savings for 350 chronically ill adults with an initial hospitalization of about $300,000
Transitional Care Model (TCM)[31–34] Mary Naylor, Ph.D.	The TCM is led by a transitional care nurse (TCN). It focuses on chronically ill, high-risk older adults hospitalized for common medical and surgical conditions. The TCN leads and begins the comprehensive inpatient planning and home follow-up. Although nurse-led, the model includes physicians, nurses, social workers, discharge planner, pharmacists, and other members of the team. Key components include focusing on patient and caregiver understanding; helping patients manage health issues and preventing decline; and providing medication reconciliation and management, together with transitional care	Marked improvements in reductions in readmissions and emergency department visits for primary and coexisting conditions; improved health outcomes after discharge; improved patient and family caregiver satisfaction; reduced total health care costs
Guided Care Model[35–39] Chad Boult, M.D.	This model is driven by a guided care nurse (GCN) working in a primary care office. The GCN uses electronic health records and works closely with patient, family caregiver, and primary care physician in conducting eight clinical processes from successful innovations in chronic care. They include assessing the patient and caregiver at home; creating an evidence-based care plan; promoting self-management; monitoring the patient's conditions monthly; coordinating the efforts of all providers; smoothing transitions between care sites; and supporting the caregiver	Preliminary data indicate that this model improves the quality of patient care, reduces use and cost of expensive services, reduces family caregiver strain, improves physician's satisfaction with chronic care

Pharmacists' Roles and Responsibilities to Improve Care Transitions

Available Evidence

Pharmacists are underused during care transitions. In a review of pharmacists' services in U.S. hospitals, only 5% of hospitals reported pharmacist-provided admission medication histories, and 49% of hospitals reported that pharmacists provided drug therapy counseling.[46] This is suboptimal because evidence supports the benefit of including pharmacists in medication reconciliation processes during care transitions, including at admission,[47] transferal from the ICU,[48] and immediately after hospital discharge.[49]

Table 2. Other National Initiatives to Improve Care Transitions

Initiative Name	Brief Description/Initiative Goal	Stakeholders	Resources
National Transitions of Care Coalition (NTOCC)[1]	Formed in 2006, the NTOCC has key stakeholders across care settings with the goal of addressing critical care transitions. This coalition has five working groups: Education and awareness Tools and resources Policy and advocacy Metrics and outcomes Health information technology (HIT)	This is a multidisciplinary coalition with representation from health care providers, insurers, employers, patients and caregivers, quality organizations	Many patient and provider tools and resources have been developed and are publically available for use on their Web site: www.NTOCC.org
Hospital to Home (H2H) Project[43]	Started in 2009, the H2H project has had the goal to reduce cardiovascular disease–related readmissions. The H2H initiative is also improving transitions from inpatient to outpatient care	The H2H initiative is led by the Institute for Healthcare Improvement and the American College of Cardiology	The H2H project has tools and strategies for evaluating readmissions for registered providers and institutions. The program also provides educational webinars

In general, studies of pharmacists' value in improving care transitions are limited to the inpatient setting in the area of admission drug histories and as part of interdisciplinary programs at discharge.[50–54] In the Medications at Transitions and Clinical Handoffs (MATCH) study, pharmacists obtained medication histories from patients admitted within 24–48 hours, which were then compared with those obtained by hospital physicians. During the 14-month study period, 5701 prescription drugs were reviewed for 651 patients on adult medicine floors. More than 33% had order errors, and the physician-obtained medication history was the source of error in 85% of patients.[55] Other studies have shown more accurate and complete admission drug histories of older, medically complex patients when taken by a pharmacist.[56]

Another well-known study evaluated the outcomes of 178 patients being discharged to home from a general medicine service at a large teaching hospital. The intervention group received discharge counseling by a pharmacist and a follow-up telephone call 3–5 days later. The pharmacist was responsible for clarifying medication regimens; reviewing indications, directions, and potential adverse effects; screening for barriers to adherence; counseling patients; and obtaining physician feedback. The primary outcome was the rate of preventable ADEs, which were detected in 11% of the control group and in 1% of the pharmacist intervention group (p=0.01). The intervention group also had fewer preventable medication-related emergency department visits or hospital readmissions (1% vs 8%, p=0.03). No differences were detected in total ADEs or health care use.[49]

Inpatient Care Settings

In general, inpatient pharmacists should participate on medical rounds (where available), perform thorough medication reconciliation and admission drug histories, apply their knowledge of drug therapy to anticipate and resolve problems during transitions, and assess the appropriateness of drug regimens, adherence issues, and health literacy.

A "gold standard" process for medication reconciliation whereby inpatient pharmacists take a preadmission medication history using all available sources of information and document their findings on standardized forms has been described.[47] Although the medication reconciliation process may be carried out by other members of the health care team, pharmacists play a vital role in ensuring the accuracy and appropriateness of a medication list. The Joint Commission does not specify who should be the "owner" of the medication reconciliation process, but only that a process should exist.[3] Although other health professionals, including medical assistants, can take a medication history, pharmacists have the specialized drug knowledge to ensure the completeness and accuracy of the medication history. New information regarding the medication history should always be communicated to other members of the health care team.

Patient and caregiver education is a major role in which pharmacists can make an impact, both

during the hospitalization and at discharge. The hospital pharmacist is well qualified to review medication additions, deletions, and other changes with the patient, family, or caregiver. Pharmacists are best equipped to explain the rationale for therapeutic selections, substitutions, or interchanges; moreover, they can reassure the patient or caregiver that the drug regimen is appropriate for the individual. Although other health professionals could provide this information, pharmacists likely have the greatest insight into the reasons for the specific medication selections or changes and can best answer medication-specific questions.

Inpatient pharmacists should routinely perform a "handoff" to other hospital pharmacists when a patient transfers, for example, from the ICU to the general wards. This form of communication would help ensure continuity of care and an understanding by the covering pharmacists of the patient's care plan and medication history in the ICU, as well as the current medication list and a copy of the patient's admission medication history.

Hospital Discharges to Home

A hospital pharmacist should attend interdisciplinary discharge rounds, especially when medically complex patients are to be discharged. The pharmacist should conduct patient discharge interviews, assess the appropriateness of discharge medications, and perform medication reconciliation to identify and resolve discrepancies. The pharmacist should also ensure that a follow-up plan for medication monitoring after discharge is discussed with the patient or caregiver. In addition, the pharmacist can provide medication counseling, including written medication information; verify patient comprehension with medication instructions; address potential adherence concerns; and communicate a reconciled medication list to the patient's follow-up provider and community pharmacist. An inpatient (or community/ambulatory care) pharmacist should provide telephone follow-up 2–4 days after discharge because this appears effective at reducing the risk of readmissions.[18, 49, 51]

Long-term Care Facilities

The consultant pharmacist is a key person to perform medication reconciliation on frail, medically complex, older adults being transferred to a LTCF. The consultant pharmacist has the requisite knowledge to ensure the residents have a drug regimen that provides the benefits and minimizes the risks in this high-risk population while assessing for potentially inappropriate medications. Although the nursing staff may be familiar with common drugs used by older adults, the pharmacist has a broader knowledge base, including how advancing age and the burden of concomitant disease may affect pharmacokinetics, pharmacodynamics, and the resulting drug dosing.[57] In addition, the consultant pharmacist will have a greater understanding of the "prescribing cascade" in which ADEs are mistaken for new conditions and of the need to discontinue medications.

The consultant pharmacist may be responsible for helping the facility maintain timely, appropriate pharmaceutical services that support residents' health care needs, are consistent with current standards of practice, and meet state and federal requirements. This responsibility includes, but is not limited to, collaborating with the LTCF and medical director to establish procedures that address MRRs for residents who are expected to stay less than 30 days or for residents who experience an acute change in their condition.

Medication reconciliation should be performed within 5 days of readmission to the LTCF after a hospitalization or dramatic change in health status. This may prevent medications that were temporarily stopped in the hospital from becoming permanently discontinued. The consultant pharmacist should also counsel family members about changes in the patient's drug regimen.

For individuals in assisted living facilities, the monthly MRR and medication reconciliation should be performed by a pharmacist to ensure the resident's well-being and appropriate care. A unique component of this assessment might also be the pharmacist's evaluation of the resident's ability to manage his or her own medications after a hospitalization. These assessments may have a considerable economic and quality-of-life impact on the resident and family when the pharmacist identifies that the resident is no longer able to self-administer medication safely and that he or she is resistant to a higher level of patient care.

Community Pharmacies

The community pharmacist's primary responsibility is to clarify potential discrepancies

between new medications after care transitions and the patient's home drug regimen. This requires contacting the primary care provider and/or specialist as well as potentially other pharmacists if a patient uses several pharmacies. These actions place the community pharmacist at the center of ensuring the appropriate use of a patient's medications and compiling an accurate and complete list of a patient's medications. This is consistent with the core elements of a medication therapy management (MTM) practice model as set forth by the American Pharmacists Association/National Association of Chain Drug Stores.[58] These elements focus on performing a comprehensive medication review and resolving identified drug therapy problems, thus providing the patient a personal medication record, creating a medication-related action plan for the patient to address any issues, and listing the intervention/referral and documentation necessary to communicate with providers and follow up with the patient.

Pharmacists may also perform home visits, ensuring that medications are stored properly and that discontinued medications are not reinitiated inadvertently. Community pharmacists should carefully review any automatic refill programs in which the patient may have enrolled in case the specific medication was discontinued on hospital discharge. Community pharmacists also assist with third-party formulary issues because prescribers may be unaware of which medications are covered by the patient's insurance and when a prior authorization is needed. In addition, community pharmacists can contribute by helping patients and caregivers interpret their discharge paperwork (and changes in their drug regimen).

Ambulatory Care

Many of the pharmacist's roles described in the transition from inpatient to outpatient care and community practice apply to the ambulatory care pharmacist as well. In addition, the ambulatory care pharmacist should take specific ownership of the accuracy and completeness of medication lists in the patient's electronic medical records within the health system.

Home Health Care

Institutions should have a dedicated discharge hospital pharmacist on the discharge planning team, especially when a patient is to receive home care services. Pharmacists can provide detailed information about the patient's medications, including insurance coverage of medications administered in the home care setting, because not all inpatient medications will be covered. Before the patient's discharge, appropriate authorizations for home infusion therapy should be obtained. When possible, hospital pharmacists should collaborate with and educate other health professionals, including intravenous infusion pharmacists, working for home health care agencies.

Medically Underserved/Homeless

Pharmacists should establish themselves within any integrated health system that serves these patients. Assessing adherence to therapy by ensuring access to medications is essential, as is evaluating the patient's health literacy so that the patient is able to interpret directions and educational materials. Patients should be assessed for their ability to store medications appropriately. Finally, pharmacists are providers of the Health Resources and Services Administration (HRSA) 340B program, which facilitates access to affordable medications—a service of particular importance after a care transition.

Recommendations for Systematic Changes to Improve Care Transitions

Education and Training of Health Care Providers

The current Accreditation Council for Pharmacy Education (ACPE) standards for pharmacy education do not explicitly address education related to care transitions.[59] Several publications have described the participation of student pharmacists on advanced pharmacy practice experiences (APPEs) in medication reconciliation and the performance of other activities related to care transitions.[60–62] This activity should become a standard part of both inpatient and outpatient APPEs during the final professional year in Pharm.D. programs. Introductory pharmacy practice experiences (IPPEs) should also include opportunities for student pharmacists to observe medication reconciliation and to be exposed to common drug-related problems that occur during care transitions. These activities might include identifying and resolving discrepancies uncovered during medication reconciliation in their professional practice laboratory courses as well as discussing care

coordination and other factors affecting patients during care transitions. In addition, an integral part of these experiences for students should include learning to work effectively on interdisciplinary teams, especially in preparing patients for care transitions.[63, 64]

Residency training is another opportunity to reinforce the pharmacist's role in care transitions. Postgraduate pharmacy training, specifically postgraduate year one (PGY1) pharmacy practice residency, is intended to enhance the pharmacist's ability to manage the medication use process and promote optimal mediation outcomes for a broad range of diseases.[65] Included among the goals of PGY1 residency programs accredited by the American Society of Health-System Pharmacists is the ability to communicate medication information when a patient is moving from one care setting to another.

The professional curricula and residency programs of other health professions also have limited education and training on care transitions. Few programs offer formal education on discharge planning, and the curricula on this topic in internal medicine residency programs are scarce.[66] One study has shown that an educational intervention for medical students on the essential elements of care transitions improved knowledge, behaviors, and self-perceived competency.[67] The intervention, delivered during a 12-week internal medicine clerkship, consisted of two learning sessions in which students reviewed topics important to care transitions, including a background on the outcomes associated with poor transitions, work with an interdisciplinary team, Medicare and Medicaid reimbursement, functional assessment, and community reimbursement. The intervention also emphasized the important role of the discharge summary in care transitions.

Overall, the current requirements for pharmacy education and residency training are insufficient to adequately prepare pharmacists for patient care activities during care transitions. The committee strongly recommends that the ACPE standards include specific language regarding the exposure of students to issues related to care transitions and that students have many opportunities to practice the requisite skills needed for effective care transitions. The committee also recommends that a specific goal for conducting medication reconciliation be included in the residency standards. An educational program similar to that previously described could be developed for inpatient APPEs in both general medicine and intensive care medicine in Pharm.D. programs.

Reimbursement

Reimbursement for nondispensing aspects of pharmacy practice remains an issue. The scope of reimbursement platforms varies among pharmacists, as with other health care providers, between settings such as hospital-based inpatient, hospital-based outpatient, long-term care, and community based. The lack of provider status under Medicare remains, although in 2009, three Current Procedural Terminology (CPT) codes were approved by the American Medical Association for MTM services that may only be used when pharmacists deliver the service.[68] This may provide a reimbursement avenue for pharmacists providing medication reconciliation services during care transitions in many settings if they are able to contract with insurance providers. Another avenue to claim reimbursement is in conjunction with a physician visit/consultation through increasing the level of service billed by the provider. In addition, with the move to newer models of care, reimbursement will no longer be tied to a specific provider or service, but instead, will be given to the PCMH or ACO, emphasizing the need for pharmacists to be recognized members of these groups. Pharmacists and administrators must explore reimbursement mechanisms, separate from the provision of drug products, to support pharmacists' time spent providing medication assistance to patients undergoing care transitions.

Health Information Technology

In December 2010, the National Transitions of Care Coalition (NTOCC) released a position paper on the use of health information technology for care transitions.[69] The NTOCC noted that the use of health information technology is not a sole solution to improving care transitions; however, it may enable multidisciplinary teams to better facilitate the transition process. For example, improved communication and transmission of information facilitated by health information technology will assist with the community pharmacist's engagement in the medication reconciliation process.[70]

The NTOCC has called for the development of health information technology with standardized processes, good communication, performance measures, accountability, and care

coordination.[69] The coalition has identified similar barriers to the implementation of health information technology, which include a lack of connectivity between systems, lack of shared goals during care transitions, misaligned financial incentives, lack of consumer knowledge and demand for a continuing care plan, and issues related to mistrust of the technology.[69]

Published data regarding the actual effect of health information technology on care transitions remain limited, and studies have found conflicting results. In one study, the use of electronic discharge summaries improved the quality and timeliness of discharge summaries,[70] whereas in another study, it was suggested that discharge software with CPOE (computerized physician order entry) did not affect readmissions, emergency department visits, or adverse events after discharge.[71] Considerable efforts are also needed to maintain systems and the accuracy of existing information. If the transferred information is inaccurate, especially with respect to electronic medication lists, for example, then technology may actually worsen problems during care transitions. Providers may develop a false sense of security regarding the accuracy of the medication list because the record is "electronic."[70, 71]

The technology required to facilitate health information transfer during care transitions already exists. Although individual providers and health systems have implemented electronic health records, the widespread adoption of an ideal system is incomplete.[72] Through the rebates available under the American Recovery and Reinvestment Act of 2009, the federal government has provided incentives for implementing the electronic health record, and the strategy appears to be working. The adoption of new technology will only be the first step, however, because individual systems will need to interface smoothly with other systems, which will require the development of extensive standards for interoperability. Finally, providers and health care systems will need to modify workflow and process policies to reflect an increased use and optimization of existing technologies.

For pharmacists to be effectively involved in care transitions, their use of information technology must be integrated into national initiatives. Recently, the Pharmacy e-Health Information Technology Collaborative was formed around the broader goal of fully integrating pharmacists into national technology initiatives.[73] A primary objective is to define the minimum data set and functional pharmacy practitioner electronic health record capabilities so that they can be part of the national initiatives.

Patient Empowerment Through Improved Health Literacy

Patients' ability to safely transition between care settings is also dependent on their ability to voice their needs to the health care providers. This may be challenging if a person has limited health literacy.[74] Studies have been conducted to determine whether different interventions before a patient's consultation with a health care provider will enhance the exchange of understandable information. A Cochrane review of 33 studies found that the collective effect of targeted interventions, including the provision of written materials or coaching before consultation, resulted in a small but statistically significant effect on patients' increased questions and increased satisfaction. The level of patient anxiety, which was higher before the consultation, thereafter decreased. Coaching resulted in higher satisfaction and patients asking important questions more efficiently, although this was a more costly intervention than written materials, which must be factored into the implementation.[75]

The National Patient Safety Foundation has collaborated with other organizations to create a program enhancing the conversation between the patient and health care provider to ensure that safe and complete information is provided and understood by the patient.[76] Recognition and incorporation of health literacy enhancement and subsequent patient empowerment in the care transition are essential in addressing barriers to care.

Summary

Patients who move between care settings are at high risk of ADEs when communication and care coordination are suboptimal. With shorter lengths of stay and higher levels of patient acuity, care transitions are a critical time to ensure optimal care and prevent avoidable readmissions. Pharmacists have unique contributions to make in improving care transitions in all settings as part of the interdisciplinary health care team.

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