






# Role of clinical pharmacists and pharmacy support personnel in transitions of care

Paul M. Stranges Pharm.D.  | Cynthia A. Jackevicius Pharm.D., M.Sc., BScPharm  | Sarah L. Anderson Pharm.D., FCCP  | Deborah S. Bondi Pharm.D. | Ilya Danelich Pharm.D. | Roshni P. Emmons Pharm.D. | Elizabeth F. Englin Pharm.D.  | Margaret L. Hansen Pharm.D. | Cara Nys Pharm.D. | Hanna Phan Pharm.D., FCCP | Ann M. Philbrick Pharm.D., FCCP | Michelle Rager Pharm.D. | Christie Schumacher Pharm.D., FCCP  | Sean Smithgall Pharm.D.

American College of Clinical Pharmacy,  
Lenexa, Kansas

## Correspondence

American College of Clinical Pharmacy 13000  
W. 87th St. Parkway, Suite 100 Lenexa, KS  
66215-4530.  
Email: accp@accp.com

## Abstract

Patients moving between health care settings or providers are at increased risk of complications, including unplanned hospital readmissions and medication errors. Several actions must occur in concert with members of the health care team and across settings to ensure coordinated and continuous care for patients undergoing these transitions of care (TOC). Clinical pharmacists support patients during care transitions by providing interventions and services designed to improve medication outcomes. Clinical pharmacists and team members who support clinical pharmacist activities (eg, pharmacy students, technicians, and residents) are located throughout the care continuum, from acute care to care in the community, with each contributing to improved TOC outcomes. This article provides information on evidence of high-impact clinical pharmacist TOC practices to serve as a practical guide for practitioners interested in starting or improving TOC activities. This article also addresses current and emerging best practices and offers suggestions for improving clinical pharmacist involvement in care transition activities.

## KEYWORDS

care transition, clinical pharmacist, pharmacy students, pharmacy technicians, readmission, rehospitalization, transitions of care

This document was prepared by the 2019 ACCP Clinical Practice Affairs Committee B: Paul M. Stranges, Pharm.D. (Chair); Cynthia A. Jackevicius, Pharm.D., M.Sc., BScPharm (Vice Chair); Sarah L. Anderson, Pharm.D., FCCP; Deborah S. Bondi, Pharm.D.; Ilya Danelich, Pharm.D.; Roshni P. Emmons, Pharm.D.; Elizabeth F. Englin, Pharm.D.; Margaret L. Hansen, Pharm.D.; Cara Nys, Pharm.D.; Hanna Phan, Pharm.D., FCCP, FPPA; Ann M. Philbrick, Pharm.D., FCCP; Michelle Rager, Pharm.D., CPP; Christie Schumacher, Pharm.D., FCCP; and Sean Smithgall, Pharm.D.

Approved by the American College of Clinical Pharmacy Board of Regents on July 28, 2019.

## 1 | INTRODUCTION

Transitions of care (TOC) involve several actions to ensure coordination and continuity of care while patients move within or among health care settings, providers, or even health states. Care transitions require a comprehensive plan of care and a well-trained health care team with knowledge of the patient's clinical status, treatment goals, and preferences. Poor care transitions threaten patient safety, reduce

consumer confidence in the health care system, and waste scarce resources.<sup>1</sup> The risk of medication errors increases during TOC, making medication management and education particularly important during this time. Objective 3.2.2 of the 2017 ACCP strategic plan calls for ACCP to “develop communications that highlight the impact of clinical pharmacists on patients’ medication-related outcomes.” The 2019 ACCP Clinical Practice Affairs B Committee was charged with updating the current state of high-impact clinical pharmacist TOC practices to serve as a practical guide for today’s practitioners and address current and emerging best practices.

## 2 | BACKGROUND

Fragmented care can result in medication errors, readmissions, complications, decreased functional status, and increased dependency. In 2011, failure to provide adequate care transitions was estimated to waste \$25 to \$45 billion.<sup>2</sup> Studies have found at least one medication discrepancy in 30% of patients discharged from the hospital to home. Up to one in five patients had an adverse event within 3 weeks of discharge, 60% of which were medication related and preventable.<sup>3,4</sup> Adequate care transitions are especially important in older adults and chronically ill patients, for whom care coordination is critical. In 2009, Jencks and colleagues showed that 19.6% of Medicare beneficiaries were readmitted to the hospital within 30 days of discharge, many of whom had no interaction with a health care professional between hospitalizations, a sign of poor care transitions.<sup>5</sup>

The 2010 ACCP Public and Professional Relations Committee developed a white paper detailing future opportunities for clinical pharmacist involvement in TOC.<sup>6</sup> This paper was timed appropriately with enactment of the Affordable Care Act (ACA), which brought opportunities for clinical pharmacists to increase their participation in care transitions. Health care organizations were financially incentivized to provide discharge education and coordination as well as reduce readmissions for key conditions to avoid financial penalties.<sup>7</sup> The ACA also built on the successes of quality improvement organizations by providing additional incentives to test different team-based care delivery models to improve quality of care, including TOC. By participating in TOC delivery models, clinical pharmacists, with their unique training and focus on team-based care and comprehensive medication management (CMM), are well equipped to help prevent the medication-related problems that plague care transitions.<sup>8</sup>

For the present paper, members of the 2019 ACCP Clinical Practice Affairs B Committee searched PubMed (MEDLINE) and ACCP databases from inception to April 2019 to identify studies describing high-impact TOC interventions involving pharmacists or pharmacy support personnel. Terms including *pharmacist*, *pharmacy*, AND *transition* OR *TOC*; *readmission*; *rehospitalization*; and *medication reconciliation* were combined and included in search queries. Titles and abstracts were screened, and full-text articles were retrieved and evaluated for inclusion. Studies were included if the interventions and outcomes were clearly defined and were not excluded on the basis of research design. From each identified

study, the authors extracted the setting(s) in which the intervention took place; the characteristics of the patients in the study; the pharmacist’s role and interventions; the intervention description, including timing and with whom the intervention was coordinated; the tools used to identify patients or communicate patient status; and other unique characteristics.

The literature contains many published examples of pharmacist impact during TOC; however, this article does not represent an exhaustive review of the literature. (For a more complete review of the available evidence, see recent systematic reviews on this topic.<sup>9-12</sup>) Rather, this article reviews representative evidence that highlights important, high-impact features of the roles of clinical pharmacists and other pharmacy support personnel in improving TOC, with particular attention given to their roles in reducing readmissions and improving medication safety. This article is designed to be a practical guide for practicing pharmacists to identify current and emerging strategies to optimize TOC.

## 3 | CLINICAL PHARMACISTS’ ROLES IN TOC

Medication errors can occur in any setting (ie, hospital, nursing facility, outpatient clinic, or home). Medication reconciliation across the continuum of care is a Joint Commission National Patient Safety Goal,<sup>13</sup> and medication management is the first of seven essential intervention categories provided by the National Transitions of Care Coalition to consider for any type of care transition.<sup>1</sup> Clinical pharmacists possess specialized therapeutic knowledge, judgment, and experience that position them to be the leading team member to help ensure medication optimization and positive patient outcomes during TOC. Clinical pharmacists accomplish this goal in a variety of ways, including supervising pharmacy support personnel like pharmacy students and technicians. Recurring activities that lead to improved TOC, regardless of setting, are detailed in Table 1.

The ideal TOC framework has 10 essential domains that form a structural “bridge” to support a patient crossing from one care environment to the next (Table 2).<sup>14</sup> These domains were developed from guideline recommendations, literature analysis, and expert opinion: (a) discharge planning; (b) complete communication of information; (c) available, timely, clear information; (d) medication safety by reconciliation across the continuum; (e) patient education to promote self-management; (f) enlistment of social and community support; (g) advance care planning; (h) coordination of team-based care; (i) monitoring and management of symptoms post-discharge; and (j) timely outpatient follow-up. Weakness in any of these domains leads to poor outcomes during care transitions. Clinical pharmacists can help strengthen many parts of this bridge; however, they cannot work alone to ensure optimal care transitions. Programs and interventions discussed in this article focus on specific pharmacy interventions and outcomes, but of note, these activities occur in concert with other interventions and services, other members of the health care team across several settings, and patients and caregivers.

**TABLE 1** Clinical pharmacist and pharmacy support personnel activities during TOC

Activity	Description	Timing
Comprehensive medication management (CMM) <sup>8</sup>	<p>Assesses the patient and indication for medications; evaluates currently prescribed medications for safety, efficacy, and cost; participates in creating a care plan, including how to address identified medication-related problems; and follows up on medication management and monitoring</p> <p>Occurs over time, and components of pharmacist-led TOC interventions may occur in different care settings to contribute to the overall CMM process</p> <p>Activities should be coordinated with and communicated to patients and other care providers</p>	<ul style="list-style-type: none"> <li>• Occurs soon after patient transitions to a new care setting</li> <li>• Continues collaboratively while patient is in current care setting</li> </ul>
Medication reconciliation	<p>Creates the most accurate list possible of all prescription and nonprescription medications, herbal, and vitamins the patient is taking, typically, by obtaining a medication history as well as reviewing pharmacy, outpatient, or inpatient records to identify new, discontinued, or changed medications</p> <p>Identifies medication discrepancies that should be communicated to/resolved with the patient and other care providers</p>	<ul style="list-style-type: none"> <li>• Occurs at time patient enters a new care setting</li> <li>• Occurs at time patient leaves a hospital/nursing facility</li> <li>• Occurs while patient is transitioning back to the community</li> </ul>
Medication and self-management education	<p>Helps patients or caregivers understand a medication's indication, administration, adverse effects, monitoring values, and follow-up. Also helps identify whether the medication is new, changed, or being replaced a previous medication</p>	<ul style="list-style-type: none"> <li>• Occurs at time of patient leaving a hospital/nursing facility</li> <li>• Occurs soon after patient transitions to a new care setting</li> <li>• Continues collaboratively while patient is in current care setting</li> </ul>
Medication acquisition assistance	<p>Helps ensure patients can start or continue medications immediately post-discharge</p> <p>Includes ensuring medications are dispensed to patient through delivery of medications or coordination with outpatient pharmacies and helping patients access prescriptions by reviewing drug formularies, reviewing medication costs, and assisting with prior authorization and other patient assistance programs, when available</p>	<ul style="list-style-type: none"> <li>• Occurs before patient leaves hospital/nursing facility or soon after</li> <li>• Continues while patient is in current care setting</li> </ul>
Follow-up call or visit	<p>Assesses whether patient has been able to follow the care plan and identifies any difficulties that need to be triaged after patient has left the previous care setting. Can be completed by the previous care setting (eg, hospital pharmacist calling after hospital discharge) or by the new care setting (eg, community pharmacist calling/seeing patient after hospital discharge). Telephone calls also help encourage patients to keep appointments and bridge patients from hospital to community settings</p>	<ul style="list-style-type: none"> <li>• Occurs soon after patient transitions to new care setting</li> <li>• Continues collaboratively while patient is in current care setting, as indicated</li> </ul>

Abbreviation: TOC, transitions of care.

**TABLE 2** Clinical pharmacist involvement in the ideal TOC model

Ideal TOC components and activities	When	Clinical Pharmacist Involvement
Discharge planning		
Create discharge plan and schedule post-discharge visits	Predischarge	X
Complete communication of information		
Discharge communication includes complete information	At discharge	X
Availability, timeliness, clarity, and organization of information		
Discharge communication is made available to health care team in timely manner	At discharge	X
Medication safety		
Medication history and reconciliation	At admission	X
Medication reconciliation and communicate medication changes	At discharge	X
Educating patients, promoting self-management		
Education on major diagnoses, medication changes, dates of follow-up appointments, self-care instructions, warning signs and symptoms, and who to contact for problems	Daily at discharge	X
Continue education post-discharge	Post-discharge	X
Enlisting help of social and community supports		
Ensure needs are being met at home	Pre-discharge Post-discharge	
Advance care planning		
Discuss goals of care and health care proxy	Pre-discharge Post-discharge	
Coordinating care among team members		
Share medical records, involve all team members, and use hand-offs	Pre-discharge Post-discharge	X
Monitoring and managing symptoms after discharge		
Monitors for worsening control, medication adverse effects, medication nonadherence, therapeutic drug monitoring, or inability to monitor disease at home	Post-discharge	X
Follow-up with outpatient providers		
Follows up with appropriate clinicians at an appropriate location and appropriate time to ensure patient progress along the plan of care	Post-discharge	X

Source: Adapted from Burke RE, Kripalani S, Vasilevskis EE, Schnipper JL. Moving beyond readmission penalties: creating an ideal process to improve transitional care. *J Hosp Med.* 2013;8 (2):102-109.

All TOC activities support the provision of CMM in coordination with other providers to optimize patient medication outcomes, regardless of care setting. Core components of CMM include assessing the patient, evaluating the medication therapy, developing and initiating a plan of care, and providing ongoing follow-up and medication monitoring.<sup>8</sup> CMM is meant to occur as a longitudinal process and during TOC, with several different pharmacists or support

personnel completing parts of the process, depending on the patient setting.<sup>15</sup> This speaks to the importance of collaboration or coordination of TOC activities, not only between professions but also within the pharmacy profession.

Pharmacy-led medication histories and reconciliation for patients when entering or leaving a care setting reduce medication discrepancies and errors.<sup>16</sup> Medication reconciliation is the process of creating

the most accurate list possible of all prescription and nonprescription medications, herbal, and vitamins the patient is taking. Each medication should include the drug name, dose, frequency, special instructions, and last refill. In addition, a complete allergy history should be obtained from the patient. A standardized documentation form can facilitate comprehensive and accurate medication reconciliation. Medication reconciliation should ideally be performed through face-to-face interviews and can be carried out by pharmacy technicians and students under the supervision of a pharmacist.

Medication education and counseling can help ensure patients understand the purpose and indication for their medications, administration instructions, monitoring instructions, and changes to medication regimens. Like medication reconciliation, medication education should be repeated in the new care setting to confirm patient understanding and can be carried out by clinical pharmacists and pharmacy support personnel in all health care settings.

Follow-ups can provide a bridge from one care setting or provider to the next, an opportunity for clinical pharmacists to check that the patient is following the care plan conveyed at the time of discharge and triage any difficulties during the patient's care transition. These activities can be flexible as far as when, where, and who is providing the follow-up contact and can incorporate CMM principles to identify, resolve, and prevent medication-related problems.<sup>17-19</sup> If timed appropriately, follow-up activities by clinical pharmacists can support requirements for transitional care management (TCM) billing as part of a collaborative care team.<sup>20-22</sup>

Interventions that focus on medication cost and acquisition can also reduce medication errors and readmissions. These interventions can include formulary and cost reviews, bedside medication delivery in the hospital, and fulfillment assistance through initiation of prior authorization requests. Bedside medication delivery ensures patient access to new and continued medications immediately post-discharge. These services can be supported by pharmacy technicians and students. When paired with discharge medication reconciliation, bedside medication delivery can improve medication adherence and reduce medication errors and readmissions.<sup>23,24</sup>

## 4 | ROLE OF PHARMACY SUPPORT PERSONNEL IN TOC

Pharmacy support personnel include pharmacy technicians and trainees such as student pharmacists and pharmacy residents and fellows. Support personnel allow for more flexibility when designing TOC programs to meet patient and institution needs. Depending on institutional or state requirements and level of trust, pharmacy support personnel can assist with any TOC activity under direct or indirect supervision. The supervising clinical pharmacist should, at a minimum, be available to the pharmacy technician or student by telephone or pager. Many studies have described the benefits of using pharmacy support personnel to facilitate TOC, including reduced readmissions, resolved medication-related problems, and improved patient satisfaction and understanding of medications.<sup>25,26</sup> Specifically, pharmacy support personnel can

obtain complete medication histories and perform medication reconciliation, update medication lists in the health record, and document TOC activities.<sup>27,28</sup> Because of the nature of these tasks, pharmacist extenders should display professionalism and possess strong communication skills, attention to detail, and self-motivation. Furthermore, experience in pharmacy, managed care, hospital, or diverse settings can better prepare pharmacy support personnel to identify common sources of medication errors.<sup>28</sup>

SafeMed is an innovative program that uses pharmacy technicians as community health workers to identify medication-related problems through home visits and telephone follow-ups after hospital discharge.<sup>29</sup> Pharmacy technician interventions include discharge medication reconciliation and assistance with obtaining discharge medications within 24 hours of discharge. Subsequently, the pharmacy technician schedules and makes telephone and in-home follow-ups called "support sessions." During the calls, technicians triage problems, arrange transportation, encourage patients to keep appointments, and engage in support sessions. During home visits, outpatient medication reconciliation is performed, medication-related education is reinforced, and medication-related problems are identified using a standardized medication reconciliation procedure and screening instrument. Patients with potential medication-related problems (eg, medication omissions, commissions, nonadherence, or adverse effects) are referred to pharmacists. Outside the support session activities, pharmacy technicians help with medication therapy management (MTM) by answering patient telephone calls, obtaining prior authorizations, and scheduling pharmacist office visits for patients with potential medication-related problems. For pharmacy technicians to have the expanded roles and responsibilities required for this model, the support of state boards of pharmacy and pharmacy associations is needed so that pharmacy technicians can work within their license. Standardized training is also necessary for pharmacy technicians to be involved in these advanced roles. In the SafeMed program, training involves didactic and interactive program-specific training, health system-specific training, and on-the-job training. In addition, patient communication and motivational interviewing skills are emphasized during the training process. Training is provided in attainment of medication histories, medication disposal policies, and basic disease management, including the ability to identify signs and symptoms of adverse events and worsening medical conditions. Competency is assessed through formal online evaluations, role-playing, and follow-up discussions with program trainers.

## 5 | BEST PRACTICES

### 5.1 | Hospitals and other acute care settings

TOC interventions performed by pharmacists in the hospital reduce readmissions and medication errors. Services can be provided in the emergency department (ED),<sup>30</sup> upon admission,<sup>31-35</sup> during transfer between units/services, at discharge,<sup>31,36-39</sup> or after discharge through a follow-up telephone call.<sup>36,38-40</sup> Table 3 provides additional

**TABLE 3** Representative examples of high-impact TOC pharmacist practices that improved patient outcomes

Target population	Team members	Pharmacist activity	TOC model	Outcomes/Results	Citation
Interventions primarily taking place in hospital settings					
Medication complexity: $\geq 4$ home medications or one high-risk medication	<ul style="list-style-type: none"> <li>Clinical pharmacist</li> </ul>	F/U call, MedEd, MR	<ul style="list-style-type: none"> <li>Medication reconciliation and education at discharge</li> <li>Telephone follow-up on days 3, 14, and 30 post-discharge</li> </ul>	<ul style="list-style-type: none"> <li>Decreased composite 30-d hospital readmissions and ED visits, 24.8% vs 39% in the control group (<math>P = .01</math>)</li> </ul>	Phatak et al. <sup>38</sup>
Adults admitted to the ED	<ul style="list-style-type: none"> <li>Clinical pharmacist</li> </ul>	MR	<ul style="list-style-type: none"> <li>Pharmacy personnel performed medication reconciliation in ED</li> <li>Pharmacist contacted care team to resolve medication discrepancies</li> </ul>	<ul style="list-style-type: none"> <li>Decreased medication discrepancies by 33% (OR 0.1055; 95% CI, 0.05-0.24; <math>P &lt; .0001</math>)</li> <li>42.7% of discrepancies had the potential to cause moderate discomfort or clinical deterioration</li> </ul>	Becerra-Camargo et al. <sup>30</sup>
Medication complexity: $\geq 3$ home medications or one high-risk medication	<ul style="list-style-type: none"> <li>Nurse</li> <li>Pharmacy technician, pharmacy student</li> <li>Clinical pharmacist</li> </ul>	MR	<ul style="list-style-type: none"> <li>Pharmacy personnel performed medication reconciliation after triage nurse in ED</li> <li>Pharmacist contacted care team to resolve medication discrepancies</li> </ul>	<ul style="list-style-type: none"> <li>1762 medication discrepancies were identified in 200 ED triage nurse histories</li> <li>68% of discrepancies (160 of 235) requiring intervention were categorized as significant, serious, or life threatening</li> </ul>	Digiantonio et al. <sup>35</sup>
High-risk discharge: CHF	<ul style="list-style-type: none"> <li>Pharmacy technician</li> <li>Pharmacy student</li> <li>Pharmacy resident</li> <li>Clinical pharmacist</li> </ul>	F/U call, MedEd, MO, MR	<ul style="list-style-type: none"> <li>Telephone follow-up on days 14 and 30 post-discharge</li> <li>Medication cost and formulary review</li> </ul>	<ul style="list-style-type: none"> <li>Decreased hospital readmissions, 21.3% vs 33.7% in the historical control group (RR 0.696; 95% CI, 0.488-0.994)</li> </ul>	Thurston et al. <sup>41</sup>
Interventions primarily taking place in outpatient clinic settings					
Medication complexity: $\geq 3$ home medications	<ul style="list-style-type: none"> <li>Physician</li> <li>Clinical pharmacist</li> </ul>	CMM, F/U visit	<ul style="list-style-type: none"> <li>CMM in-clinic visit within 60 d post-discharge</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 60-day hospital readmissions, 18.2% vs 43.1% in the control group (<math>P &lt; .01</math>)</li> </ul>	Bellone et al. <sup>42</sup>
Age $\geq 18$ -89	<ul style="list-style-type: none"> <li>Clinical pharmacist</li> </ul>	CMM, F/U call	<ul style="list-style-type: none"> <li>Telephone follow-up within 48-96 h post-discharge</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 30-day hospital readmissions, 22% vs 52% in the control group (<math>P &lt; .01</math>)</li> </ul>	Anderson et al. <sup>43</sup>
High-risk discharge: CHF, COPD, diabetes, CVA, AMI, $\geq 3$ hospitalizations in the past 5 years	<ul style="list-style-type: none"> <li>Clinical pharmacist</li> </ul>	CMM, F/U visit	<ul style="list-style-type: none"> <li>CMM in-clinic visit within 72 h post-discharge before physician appointment</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 30-day hospital readmission and ED visits, 0% vs 40.5% in the control group (<math>P &lt; .01</math>)</li> <li>Decreased medication discrepancies</li> </ul>	Hawes et al. <sup>44</sup>
Medication complexity: $\geq 8$ scheduled medications	<ul style="list-style-type: none"> <li>Social worker</li> <li>Pharmacy resident</li> <li>Clinical pharmacist (inpatient, clinic based)</li> </ul>	CMM, F/U visit	<ul style="list-style-type: none"> <li>CMM in-home visit within 3-5 d post-discharge</li> </ul>	<ul style="list-style-type: none"> <li>Decreased medication discrepancies</li> </ul>	Pherson et al. <sup>45</sup>

(Continues)

TABLE 3 (Continued)

Target population	Team members	Pharmacist activity	TOC model	Outcomes/Results	Citation
Readmission risk score (internal tool)	<ul style="list-style-type: none"> <li>Care navigator</li> <li>Physician</li> <li>Clinical pharmacist</li> </ul>	CMM, F/U visit	<ul style="list-style-type: none"> <li>CMM in-clinic visit within 7 d post-discharge coordinated with physician appointment</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 30-day hospital readmissions, 14.3% vs 34.3% in the control group (<math>P = .01</math>)</li> <li>Decreased medication discrepancies</li> </ul>	Cavanaugh et al. <sup>46</sup>
High-risk discharge: CHF	<ul style="list-style-type: none"> <li>Nurse</li> <li>Physician assistant</li> <li>Physician</li> <li>Clinical pharmacist</li> </ul>	CMM, F/U visit	<ul style="list-style-type: none"> <li>CMM in-clinic visit within 7–14 d post-discharge</li> <li>Ongoing CMM visits over 12 weeks</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 90-day hospital readmissions for CHF, 7.6% vs 23.3% in the control group (<math>P &lt; .01</math>)</li> <li>Decreased 90-day time to first CHF or all-cause mortality, 9% vs 28.6% in the control group (<math>P &lt; .01</math>)</li> <li>Improved medication adherence to <math>\beta</math>-blockers, ACE (angiotensin-converting enzyme) inhibitors, aldosterone antagonists</li> </ul>	Jackevicius et al. <sup>47</sup> Lu et al. <sup>48</sup>
All adult patients	<ul style="list-style-type: none"> <li>Physician</li> <li>Clinical pharmacist</li> </ul>	CMM, F/U visit, MC	<ul style="list-style-type: none"> <li>CMM in-clinic visit within 7 d post-discharge before physician appointment</li> </ul>	<ul style="list-style-type: none"> <li>Decreased medication discrepancies</li> </ul>	Armor et al. <sup>49</sup>
Adults $\geq 60$	<ul style="list-style-type: none"> <li>Social worker</li> <li>Physician</li> <li>Pharmacy resident</li> <li>Clinical pharmacist</li> </ul>	CMM, F/U call, F/U visit	<ul style="list-style-type: none"> <li>Telephone follow-up within 48–96 h post-discharge</li> <li>In-clinic visit within 7 d post-discharge coordinated with physician appointment</li> <li>Intensive follow-up for 3 mo post-discharge for certain conditions</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 30-day hospital readmissions, 11.7% vs 17.3% in the control group (<math>P &lt; .01</math>)</li> <li>Cost avoidance estimated to be \$2138 per completed intervention</li> </ul>	Stranges et al. <sup>18</sup>
Interventions primarily taking place in community pharmacy settings					
Location based: Community pharmacy customers and employees	<ul style="list-style-type: none"> <li>Clinical pharmacist</li> </ul>	CMM, F/U call	<ul style="list-style-type: none"> <li>CMM by telephone or in-person CMR within 17 d post-discharge</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 30-day hospital readmissions, 11.1% v. 36.3% in the control group (<math>P = .032</math>)</li> <li>Resolved 86% of medication-related problems (44% through patient or caregiver, 33% through PCP)</li> </ul>	Fanizza et al. <sup>50</sup>
Readmission risk score (BOOST)	<ul style="list-style-type: none"> <li>Nurse (inpatient)</li> <li>Clinical pharmacist (inpatient, community)</li> </ul>	CMM, F/U call, MedEd, MO	<ul style="list-style-type: none"> <li>Predischarge medication counseling</li> <li>Provided first-fill medications predischarge</li> <li>Two telephone follow-ups 8 and 25 days post-discharge</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 30-day same-hospital readmissions, 8.1% vs 21.4% in the control group (<math>P &lt; .01</math>)</li> <li>Decreased medication discrepancies</li> </ul>	Feldman et al. <sup>17</sup>
Location based: Rural areas	<ul style="list-style-type: none"> <li>Nurse (inpatient)</li> <li>Social worker (inpatient)</li> </ul>	F/U call, MO, MR	<ul style="list-style-type: none"> <li>Provided short supply of medications delivered to home, old medications removed on day of</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 30-day unplanned-hospital readmissions, 11% vs a 15.2% national rate for</li> </ul>	Frail et al. <sup>51</sup>

(Continues)

TABLE 3 (Continued)

Target population	Team members	Pharmacist activity	TOC model	Outcomes/Results	Citation
	<ul style="list-style-type: none"> <li>Pharmacy student</li> <li>Clinical pharmacist (inpatient, community)</li> </ul>		discharge, and ongoing adherence to packaging and medication delivery <ul style="list-style-type: none"> <li>Two telephone follow-ups within 72 h post-discharge and again within 1 mo post-discharge</li> <li>Letter sent to PCP identifying medication discrepancies and recommendations</li> </ul>	Medicare patients ( $P < .05$ ) <ul style="list-style-type: none"> <li>Patient satisfaction with pharmacy services was rated as <math>\geq 3</math> on a 4-point scale</li> <li>Program was terminated early because of enrollment challenges</li> </ul>	
High-risk discharge: CHF	<ul style="list-style-type: none"> <li>Nurse (home health)</li> <li>Pharmacy resident</li> </ul>	CMM, F/U call, F/U visit	<ul style="list-style-type: none"> <li>CMM visit in-home visit within 7 d of discharge</li> <li>Two telephone follow-up calls at weeks 1 and 4 after initial visit post-discharge visit</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 30-day CHF hospital readmissions, 10% vs 38% agency mean (statistical significance not reported)</li> <li>Increased medication adherence</li> </ul>	Kalista et al. <sup>52</sup>
High-risk discharge: CHF, pneumonia, or COPD	<ul style="list-style-type: none"> <li>Nurse (inpatient, home health)</li> <li>Clinical pharmacist</li> </ul>	CMM, F/U call, F/U visit	<ul style="list-style-type: none"> <li>CMM visit at the pharmacy within 72 h and 7 d post-discharge</li> <li>Telephone follow-up 2 weeks after initial visit to review action plan</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 30-day hospital readmissions, 7% vs 20% in the usual care group (<math>P = .017</math>)</li> <li>Primary care physician accepted 46% of interventions</li> <li>Patients accepted 72% of medication change or self-care modification recommendations</li> </ul>	Luder et al. <sup>53</sup>
High-risk discharge: HF, pneumonia, or AMI	<ul style="list-style-type: none"> <li>Care navigator (inpatient)</li> <li>Clinical pharmacist</li> </ul>	CMM, F/U call	<ul style="list-style-type: none"> <li>CMM using standardized questionnaire by telephone within 2–7 d post-discharge</li> <li>Community pharmacist was granted access to electronic health record</li> </ul>	<ul style="list-style-type: none"> <li>Decreased 30-day hospital readmission rates, 16% vs 33% in the historical control group (statistical significance not reported)</li> <li>Decreased medication discrepancies</li> <li>Increased HCAHPS score related to medication education, 72% vs 65% positive for the historical control group</li> </ul>	Snodgrass et al. <sup>54</sup>

Abbreviations: AMI, acute myocardial infarction; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; CVA, cerebrovascular accident; F/U call, post-discharge follow-up call; F/U visit, post-discharge follow-up visit; HF, heart failure; MO, medication obtainment or cost intervention; MedEd, counseling and education on medications; MR, medication reconciliation; OR = odds ratio; PCP, primary care provider.

details for select examples of pharmacist TOC interventions in the hospital setting. The hospital setting can make TOC more feasible by enhancing pharmacist opportunities for collaboration with other disciplines and improving access to the patient's inpatient health record. Successful hospital-based TOC programs follow a standardized process, ensure timely and effective communication among team members, and have a dedicated service targeting patients undergoing TOC.<sup>55</sup> Patients in rehabilitation centers and skilled nursing facilities, similar to hospitalized patients, can also benefit from pharmacist-

provided TOC activities, though resources and access to information may vary. Pharmacist TOC activities can be performed by central/general pharmacists, decentralized pharmacists located in units or on services, or dedicated TOC pharmacists, technicians, or students.

Pharmacy teams should be able to identify patients entering the hospital, transferring to a new team, or preparing for discharge in order to obtain a medication history, reconcile medications, provide CMM, and start planning for discharge. An institution may initially consider targeting certain patient groups with documentation in



improved patient outcomes after TOC services. Examples of such groups include patients with high readmission risk disease, such as those included in the Centers for Medicare & Medicaid Services (CMS) Hospital Readmissions Reduction Program (HRRP)<sup>41</sup>; patients taking high-risk medications or a high volume of prescriptions<sup>38</sup>; and patients in high-risk or time-pivotal departments, such as the ED.<sup>30</sup> Although all patients in the hospital should ideally receive TOC services provided by a pharmacist, identification of key target populations can be vital when resources and personnel are limited.

As part of the discharge planning process, pharmacy teams should review the discharge medication list, identify and begin to resolve any issues that might prevent the patient from acquiring new or changed medications, and counsel patients on new medications or changes from home medications preadmission. In addition, during the discharge process, pharmacists should contribute to verbal or written communications regarding the hospitalization to outpatient pharmacies and prescribers to ensure that the necessary information is shared. Finally, pharmacy teams can partner with a clinic- or community-based pharmacy to dedicate specific times throughout the week to follow up with patients discharged home.

## 5.2 | Outpatient clinic settings

After leaving an acute care setting like a hospital or rehabilitation center, patients need follow-up visits in primary care or specialty clinics to continue their recovery. TOC activities performed by clinic-based pharmacy teams also improve patient outcomes (Table 3). Similar to in the hospital setting, clinic-based pharmacists work collaboratively with the patient's care team and have access to the patient's outpatient medical record. Health system clinic-based pharmacists may also have access to inpatient records. Almost all clinic-based TOC models include at least one of the following provided by the pharmacist: CMM, medication education, or self-efficacy counseling. Interventions reduce readmissions, resolve medication-related problems, and increase the patient's self-reported medication knowledge and adherence.<sup>43,45,56</sup>

Ideally, the post-discharge follow-up should be planned and scheduled at the time of hospital discharge to ensure that a plan is in place before the patient leaves the hospital. Contact may occur as a telephone call before the patient's scheduled outpatient visit, during the visit, or at the patient's home and can contribute to TCM billing. Initial contact is typically provided by telephone within 48 to 72 hours post-discharge or through face-to-face visits within 7 to 14 days post-discharge, depending on the patient's medical complexity. Pharmacists should assist with reconciling medications, providing medication education and monitoring recommendations, and performing CMM during these encounters. A triage protocol should be established to provide guidance when a patient's clinical status requires more urgent attention or if a patient was unable to start, stop, or change medications as recommended at discharge.

Somewhat unique to clinic-based pharmacists is their ability to contribute to billable TCM encounters. Pharmacist activities during follow-up calls and visits should be documented, shared, and coordinated with a billing provider for TCM. In addition to contributing to

billable TCM, clinic-based pharmacists can justify their services with other financial metrics such as cost-avoidance or cost-savings data related to reduced readmissions and identification and resolution of medication-related problems.<sup>41-43,47,48</sup>

## 5.3 | Community pharmacy settings

Community pharmacists are often the first health care providers that patients encounter when transitioning back home post-hospitalization. In this position, community pharmacists can help facilitate timely access to medications, provide medication education, and triage medication-related problems that arise post-discharge.

Most successful community pharmacy TOC interventions occur through a comprehensive medication review (CMR) intervention by telephone to improve outcomes (Table 3).<sup>50,54,57</sup> Telephone interventions are advantageous because patients should not travel if not feeling well, and a telephone call can easily be incorporated into the pharmacist's workflow. In-pharmacy visits, in-home visits, and virtual visits using video conferencing have also been successful.<sup>51,53,58</sup> CMRs can take 30 to 60 minutes to complete, depending on patient complexity, in addition to the time needed to schedule patients, complete documentation, and communicate with other members of the health care team. As such, community pharmacists must have time available for these services, whereas other staff can handle dispensing and other activities within the pharmacy.<sup>53</sup> Alternatively, support staff can assist with scheduling and follow-up to allow pharmacists to focus on the CMR.<sup>57</sup>

Lack of access to the patient medical record or discharge summary can be a barrier for community pharmacies in effectively offering TOC services. However, health information exchanges (HIEs) allow health care providers and patients to electronically access and share medical information to improve the speed, quality, safety, and cost of health care. Moreover, use of HIEs by community pharmacies has expanded in recent years, with some HIE systems integrating their data into pharmacy dispensing software.<sup>59</sup> In one study that used a state HIE to access patients' discharge documentation, 85% of participants had an electronic medical record in the exchange.<sup>50</sup> However, the quality of the information was highly variable, with only 50% of the patients having a documented reason for admission and only 12.5% having a discharge medication list available. To be effective, HIEs should contain essential medical information that can be found in patient medical records. One way to gain access to patient medical records and discharge summaries is to partner with local hospital institutions, especially in rural settings. This may require collaborating with and educating hospital leaders and inpatient personnel on the benefits, roles, and services that community pharmacists can offer for improving TOC.<sup>51</sup> These partnerships are especially important because community pharmacies rely on inpatient personnel, including nurses, care managers, and social workers, to recruit patients and coordinate discharge information delivery.<sup>17,51-54,57</sup> Having access to patient health information data and a direct line of communication with the patient's primary care team is ideal for community pharmacies. This is important because time spent by community pharmacists

or support personnel in delivering medications, tracking down medication lists, or calling primary care providers for the medication information needed to complete medication reconciliations and following up on medication-related problems accrues staffing costs.<sup>50,53</sup>

Community pharmacy interventions can generate revenue or offset costs through MTM billing, TCM billing if integrated into clinic-based medical records, medication delivery, and unique partnerships with primary care clinics.<sup>50,51,53,54,57</sup> Feldman et al described a collaborative model in which a hospital paid 11 community pharmacies \$40 per discharge follow-up telephone call, which contributed to reduced readmissions.<sup>17</sup> Bedside medication delivery by community pharmacies can be paired with medication education and help establish new patient relationships.<sup>17,51</sup>

However, community pharmacists encounter unique barriers to providing effective TOC interventions. Response rates to inquiries related to issues identified during TOC activities are low, with one study showing only a 46% response rate by primary care providers.<sup>53</sup> Moreover, patients often decline TOC services or do not show up for post-discharge visits. Competing messaging from other pharmacies or primary care providers may hinder the community pharmacist's ability to enroll patients or complete interventions and can lead to patient confusion about care plans and medication reconciliation. There also may be negative perceptions of hospitals sending patients to specific pharmacies that patients do not choose themselves. Hospital personnel involved in discharge may be unaware of community pharmacist-based TOC services or lack knowledge about the community pharmacist's ability to conduct CMRs.<sup>54</sup> Because of these barriers, current best practice is to connect a patient with a TOC service at a community pharmacy where they have an established relationship.

## 6 | RECOMMENDATIONS FOR IMPROVING TOC

Although clinical pharmacists are an integral part of safe TOC, barriers limit the implementation of some or all of these services. The American Society of Health-System Pharmacists and the American Pharmacists Association have identified several primary threats to optimal TOC services within inpatient and outpatient settings. These barriers include financial and staffing constraints, lack of universal HIE, and difficulty developing partnerships with outside organizations, as well as several communication barriers.<sup>15</sup> Ideally, clinical pharmacists should be able to provide these services consistently and collaboratively with the patient's entire health care team, regardless of the day of the week or the health care system.

### 6.1 | Billing and reimbursement

In 2013, two Current Procedural Terminology (CPT) codes for TCM services were implemented to improve discharge care coordination and ensure that patients are seen in their physician's office post-hospitalization (Table 4). These codes are designed to provide more

**TABLE 4** TCM service-required elements

99495 TCM services with the following required elements	99496 TCM services with the following required elements
Communication (direct contact, telephone, electronic) with the patient and/or caregiver within 2 business days of discharge	Communication (direct contact, telephone, electronic) with the patient and/or caregiver within 2 business days of discharge
Medical decision making of at least <i>moderate complexity</i> <sup>a</sup> during the service period	Medical decision making of at least <i>high complexity</i> <sup>a</sup> during the service period
Face-to-face visit within 14 calendar days of discharge	Face-to-face visit within 7 calendar days of discharge

Abbreviation: TCM, transitional care management.

<sup>a</sup>Information distinguishing moderate- and high-complexity patients as well as further information about TCM services is available from: <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/Transitional-Care-Management-Services-Fact-Sheet-ICN908628.pdf>.

care coordination, education, and clinical management during the critical period post-discharge and include management/coordination of all services for medical conditions and activities of daily living. TCM services can be provided to any beneficiary transitioning from an inpatient hospital setting, skilled nursing facility, long-term care facility, or rehabilitation center to their home or place of residence, assisted living facility, or nursing facility, if not a skilled facility.<sup>60</sup> The three main components required to bill for TCM services are (a) an interactive contact within two business days post-charge, (b) non-face-to-face services, and (c) a 7- or 14-day post-discharge face-to-face visit. TCM components must occur after hospital discharge and no later than the day of the face-to-face visit. Only eligible physicians and nonphysician providers who are legally authorized Medicare Part B providers can perform the face-to-face visit. Because TCM can be billed by only one eligible provider in a 30-day period, coordination is required between the patient and the patient's other eligible providers to determine who takes responsibility for the service. TCM services cannot be billed together with codes for the supervision of home health services, and chronic care management (CCM) codes cannot be billed in the 30-day period during which the TCM code is eligible.

Pharmacists, within their collaborative practice agreement and/or scope of practice and under incident-to rules, can perform the interactive contact, non-face-to-face services and assist in performing medication reconciliation and assessing medication appropriateness during the face-to-face visit. TCM services medication reconciliation must include an assessment of medication appropriateness, administration timing, drug interactions, laboratory monitoring, and adverse event monitoring for all the patient's medications. Pharmacists can also help provide disease education and other care coordination tasks, which may allow physicians to increase the capacity of their clinic schedule. Potential revenue generated from TCM services is based on the Medicare Physician Fee Schedule.<sup>61</sup> Compared with established patient evaluation and management CPT codes for patients with similar complexities of medical decision making, CPT billing code 99495

generates about \$60 more than CPT billing code 99214, whereas CPT code 99496 generates about \$90 more than CPT code 99215. Because pharmacists contribute to but cannot solely complete TCM, it is important to clearly delineate their responsibilities and attribution within TCM billing.

Another avenue by which to demonstrate pharmacists' value in TOC is to clearly show cost avoidance or decreased health care use with pharmacist-led activities. In alternative payment models, such as accountable care organizations (ACOs) and value-based contracts, decreasing the number of inappropriate medications and optimizing medication therapy for the patient's various chronic diseases can be valuable because this reduces the overall cost of care. In addition, providing timely education and management can reduce the patient's risk of a future hospitalization. Medication education is also important for patient satisfaction and is included in many Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) surveys, the results of which can affect an organization's reimbursement and ratings. One analysis of a pharmacist-provided TOC program showed that when pharmacists contacted patients at home to reconcile their medication list with their hospital discharge list and applied the principles of CMM, the managed Medicaid plan had a potential cost savings of more than \$25 million over 2 years, corresponding with more than \$4 per member per month. These pharmacists used CMM techniques, which included assessing medication appropriateness, effectiveness, safety, and ability to be taken as directed.<sup>20</sup> Other research has shown that when pharmacists are involved in TCM services and medication optimization for many diseases, health care costs decrease through reduced hospitalizations.<sup>21,22</sup> As health care payment systems evolve, clinical pharmacists must continue to look for opportunities to optimize reimbursement for their cognitive services, much like they have in ACO models.

Foundations and grants may also provide avenues to support pharmacist-led TOC activities. In one such example, the Cystic Fibrosis (CF) Foundation developed recent funding mechanisms to promote the addition of pharmacists and pharmacy technicians in CF care centers.<sup>62</sup> In addition to supporting the clinical pharmacist's role in CF clinics, such funding helps support the addition of pharmacy technicians. Possible pharmacy technician responsibilities in this setting include medication reconciliation, prior authorizations, preclinic visit communication (eg, reminders of visits, preliminary medication history, triage for patient/family concerns or questions for CF care team members), assistance with application to patient assistance programs, and insurance navigation support. With this added support, CF clinical pharmacists have more bandwidth to provide clinical pharmacy services.

## 6.2 | Health information technology and emerging technologies

Use of health information technology (HIT) can improve the efficiency and effectiveness of TOC activities. A shared electronic medical record allows for communication among different providers within

and outside health care systems, especially when patients see several provider specialists in different locations. Standardized tools designed to improve communication during TOC, such as the CMS Continuity Assessment Record and Evaluation (CARE) item set, can easily be distributed through a shared health record or HIE.<sup>63</sup> If feasible, participating in HIEs like Epic Care Everywhere can also allow providers to view patient information from participating outside hospitals and health systems.

In addition, HIT can be used to help TOC activities operate more efficiently, pool resources, reduce service-related costs, and reach a wider and more in-need population. First, HIT can give pharmacists the ability to more easily and quickly identify and prioritize patients at risk of poor transitions using risk stratification rules than when manually reviewing patient lists. This is particularly true when risk scores from validated tools are integrated into the electronic medical record to generate a list of high-risk patients. Second, HIT can allow pharmacists to reach patients with transportation, mobility, or other access issues using telehealth solutions.

## 6.3 | Risk stratification

Although all patients in the hospital should ideally receive TOC services by a pharmacist, identification of high-risk patients becomes especially important when resources and personnel are limited or cannot match volume. Many programs target high-risk discharge conditions identified in the CMS HRRP.<sup>64</sup> For example, Thurston and coworkers showed that hospital readmissions for high-risk patients with heart failure were reduced from 33.7% to 21.3% (relative risk [RR] 0.696; 95% confidence interval [CI], 0.488-0.994) through a multicomponent pharmacist-led intervention.<sup>41</sup> Other programs identifying high-risk patients on the basis of targeted medications or number of discharge prescriptions (eg, three or more new medications) found that pharmacist-provided TOC activities reduced readmissions from 39% to 24.8% ( $P = .01$ ), with a nonstatistically significant reduction in adverse drug events and improvement in HCAHPS scores.<sup>38</sup> Examples of validated instruments that aid in risk stratification include the four-factor LACE score (length of stay, acuity of admission, comorbidities, and ED visits) and the 8-point screening tool based on the Better Outcomes for Adults through Safe Transitions (BOOST) project.<sup>17,65</sup> Other programs use service location as an identifier. One example is the ED, where many studies have shown that medication-related problems are common, especially among patients who are taking high-risk medications or prescribed three or more drugs, and pharmacy interventions like medication reconciliation reduce costly medication errors.<sup>30,35</sup>

Partnerships with other health care professionals or relationships with outside health systems or hospitals also help clinical pharmacists identify patients needing pharmacist intervention during TOC.<sup>17,53,54,57</sup> Hospital staff (nursing, social work, case managers, discharge planners) can be essential partners in identifying high-risk patients and coordinating care with pharmacist-led TOC programs.

## 6.4 | Training

For clinical pharmacists to develop and participate in effective TOC programs, they must have good communication skills, foundational knowledge, and experience with various health care systems and settings, patient factors, and other problems such as social determinants of health. They must also be aware of the pharmacist's role in TOC best practices. Therefore, clinical pharmacists must have focused training to provide successful TOC activities.<sup>66</sup> Such training can be acquired through education in pharmacy schools, postgraduate training, and professional development programs delivered within or outside a specific health system. Although current Accreditation Council for Pharmacy Education standards have no explicit requirements for pharmacy school curricula to include TOC issues, many domains and subdomains indirectly apply.<sup>67</sup> Pharmacy schools can incorporate activities into simulation labs to demonstrate the pharmacist's role in care transitions in various practice settings.<sup>68</sup> Exposure to and training in TOC is more consistent in postgraduate year 1 (PGY1) and year 2 (PGY2) training programs. Some residency programs have successfully developed TOC rotations as part of their PGY1 programs.<sup>69</sup> Moreover, practicing pharmacists can use professional organization resources, continuing education, and certification programs to increase their understanding of and competency in TOC.

## 6.5 | Documentation

Finally, documentation of TOC activities is essential to garner or reinforce institutional support of these activities, especially if there is a need to justify a service or assist with disseminating program descriptions. Documentation and clearly defined interventions and outcomes can also assist with internal quality improvement efforts as well as external comparisons. Commonly used outcomes include medication errors prevented, reductions in 30-day readmissions, increased patient adherence and satisfaction, cost reductions by medication selection, and improved disease-specific clinical outcomes.

## 7 | CONCLUSION

Clinical pharmacists and pharmacy support personnel can help support ideal TOC from one health care setting to the next to improve patient outcomes. The five key components of pharmacy interventions, regardless of setting, are provision of medication reconciliation and attainment of medication history taking, assistance with access to medications, and provision of medication and self-management education, post-discharge follow-up, and CMM. However, pharmacist interventions do not occur in a silo. Efforts must be team based and coordinated among different members of the health care team, including other clinicians, nurses, social workers, and care coordinators. Use of pharmacy support personnel, billing or cost-avoidance opportunities, HIT, risk stratification, and intentional training and

documentation can help pharmacists provide efficient and effective TOC services.

## ACKNOWLEDGMENTS

The authors would like to recognize M. Shawn McFarland, Pharm.D., FCCP, for his contributions to this white paper.

## CONFLICT OF INTEREST

Hanna Phan is Grant Recipient/Co-Principal Investigator for Pharmacist/Pharmacy Technician for Outpatient Pharmacy Services, Cystic Fibrosis Foundation.

## ORCID

Paul M. Stranges  <https://orcid.org/0000-0003-3797-2762>  
 Cynthia A. Jackevicius  <https://orcid.org/0000-0001-5274-7251>  
 Sarah L. Anderson  <https://orcid.org/0000-0002-8420-9527>  
 Elizabeth F. Englin  <https://orcid.org/0000-0001-6657-4873>  
 Christie Schumacher  <https://orcid.org/0000-0002-6501-1590>

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**How to cite this article:** Stranges PM, Jackevicius CA, Anderson SL, et al. Role of clinical pharmacists and pharmacy support personnel in transitions of care. *J Am Coll Clin Pharm*. 2020;3:532–545. <https://doi.org/10.1002/jac5.1215>