

# Pharmacist-led transitions-of-care program reduces 30-day readmission rates for Medicare patients in a large health system

**Daryl Miller, PharmD**, St. Joseph's Hospital, Tampa, FL

**Melissa Ramsey, PharmD**, Morton Plant North Bay Hospital, New Port Richey, FL

**Timothy R. L'Hommedieu, PharmD, MS**, BayCare Health System, Clearwater, FL

**Lauren Verbosky, PharmD, MS**, BayCare Health System, Clearwater, FL

**Purpose.** This report describes the growth and development of the Pharmacy Transitions of Care (PTOC) program at a Florida health system and examines its impact on 30-day readmission rates for Medicare core-measure patients.

**Summary.** BayCare Health System is a large not-for-profit community health system with 15 hospitals in central Florida. In 2015, the PTOC program was developed to integrate 2 pharmacists into the transitions-of-care space to reduce readmissions, enhance patient care, and improve medication safety. The PTOC program focuses on traditional Medicare beneficiaries 65 years of age or older with the goal of preventing 30-day readmissions. The service model includes integration of a pharmacist into the discharge medication reconciliation process, as well as postacute care telephonic follow-up. Data and outcomes have been carefully tracked since program inception and consistently demonstrate a reduction in 30-day readmissions, with a 63% relative risk reduction during the beginning phases of the program and a ratio of observed to expected readmissions of 0.77. As a result, in less than 3 years the PTOC program has grown from 2 to 23 pharmacists and is a key component of BayCare Health System's patient care strategy.

**Conclusion.** Medication reconciliation, clinical interventions, and patient education by pharmacists after hospital discharge reduced 30-day readmission rates for Medicare core-measure patients across a large health system. The adaptability of this program to other health systems and hospitals of varying size to achieve similar outcomes is valuable to share with the profession.

**Keywords:** medication reconciliation, readmission, transitions of care

**Am J Health-Syst Pharm.** 2020;77:972-978

The Hospital Readmissions Reduction Program (HRRP) was established by the Affordable Care Act in 2012. The HRRP required the Centers for Medicare & Medicaid Services (CMS) to penalize hospitals by reducing reimbursement for excess 30-day readmissions. CMS currently focuses on 30-day readmissions for 6 core-measure populations: patients with acute myocardial infarction (AMI), chronic obstructive pulmonary disease (COPD), heart failure (HF), pneumonia (PNA), or coronary artery bypass graft (CABG) and patients who have had elective total hip or knee arthroplasty.

Under the HRRP, hospitals face an up to 3% penalty for excess readmissions.<sup>1</sup> Over 2,500 hospitals will face a penalty for the 2019 fiscal year, which will equate to \$566 million in total for all penalized hospitals.<sup>2</sup>

The financial incentive established by HRRP encouraged more focus on discharge planning and the postdischarge care of patients. With the intent of reducing 30-day readmission rates, hospitals throughout the country started developing innovative programs to promote better transitions of care for discharged patients.

Address correspondence to Dr. Miller ([daryl.miller@baycare.org](mailto:daryl.miller@baycare.org)).

© American Society of Health-System Pharmacists 2020. All rights reserved. For permissions, please e-mail: [journals.permissions@oup.com](mailto:journals.permissions@oup.com).

DOI 10.1093/ajhp/zxaa071

Given that medication therapy is a primary modality for treatment and health maintenance, the transition from hospital to home can leave patients susceptible to potential medication-related problems. In fact, it is estimated that medication-related adverse events account for 20% of readmissions and that two-thirds of those readmissions are preventable.<sup>3,4</sup>

Known as the medication experts, pharmacists have the ability to play a major role in reducing medication-related problems and optimizing patient care. Professional organizations studying transitions of care have endorsed the role of the pharmacist in transitions-of-care models.<sup>5,6</sup> In the 2013 publication *ASHP/APhA Medication Management in Care Transitions Best Practices*, transitional care programs were demonstrated to have an impact on 30-day readmissions, with absolute readmission risk reductions in the range of 2% to 15%.<sup>6</sup> Current programs using pharmacists in transitional care employ a variety of practice models. Many target a diverse array of patient populations, specific disease states, and underserved patients. The variance of practice models and service make it difficult to identify an effective model that can be applied across an integrated delivery network with hospitals of varying size, acuity, patient population, and location. This article provides a model that is effective and scalable across hospitals of varying size, geographical location, and patient population.

## Background

BayCare Health System is a large not-for-profit community health system, with 15 hospitals (bed count range, 72-613) and a wide range of inpatient and outpatient services, that serves 4 counties in the state of Florida. The organization sought to improve quality and reduce readmission rates by investing in programs with a transitional care focus. Prior to this, there were limited dedicated teams or initiatives with a focus on readmission prevention. The process was primarily

## KEY POINTS

- As medication experts, pharmacist have the ability to impact patients in the transitions-of-care space.
- BayCare Health System has created a sustainable pharmacist transitions-of-care program that can be reproduced in other health systems.
- Medication reconciliation and postacute care telephonic outreach by pharmacists has been demonstrated to reduce 30-day readmissions.

owned by inpatient case management personnel, who provided a brief phone call to patients 48 hours after discharge. In 2015, several readmission programs were developed, including a pharmacist-facilitated initiative described in this report.

## Problem

Medication-related problems after hospital discharge are associated with increased 30-day readmissions. Pharmacy leaders identified an opportunity to utilize pharmacists' expertise to reduce readmissions, and the Pharmacy Transitions of Care program (PTOC) was created. This report describes the development and growth of the PTOC and its impact on 30-day readmission rates in a Medicare population.

## Implementation process

**Program development.** Developed in 2015 to integrate pharmacists into the transitional care space, the PTOC was implemented with 2 pharmacist full-time equivalents (FTEs) and scaled in a stepwise fashion. [Figure 1](#) shows the detailed progression of the program. Key phases of program development are described below.

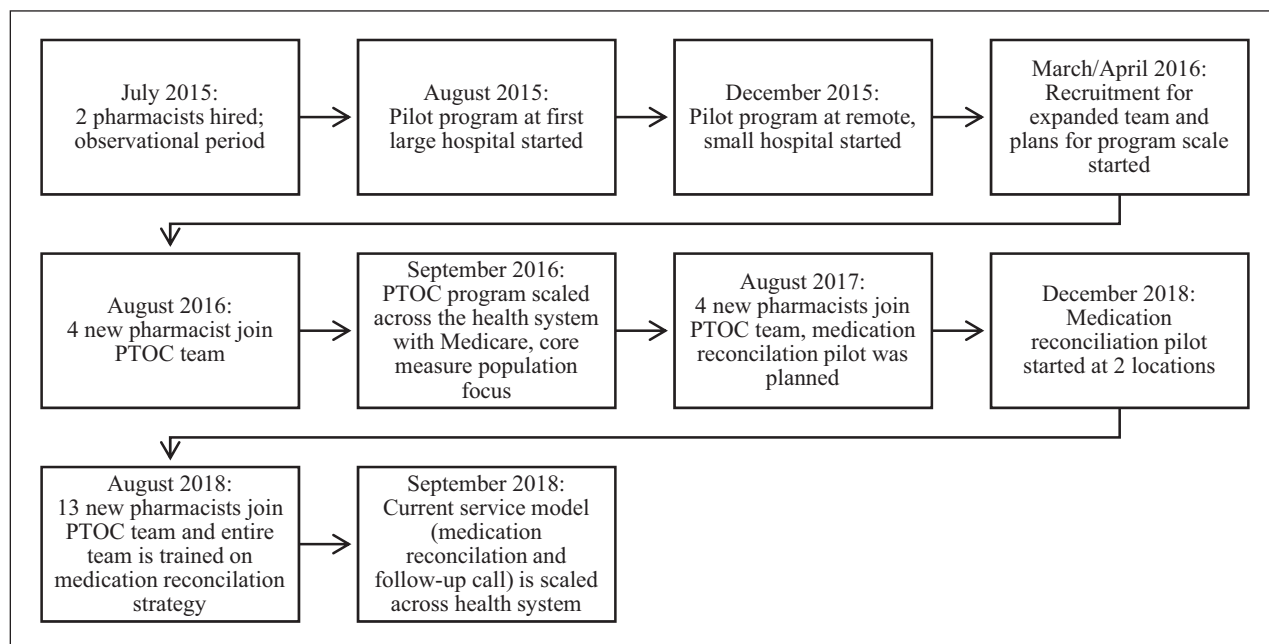
*Phase 1.* The pharmacists led a 1-month observational period to map

inpatient processes, gain buy-in from key stakeholders, and identify areas for maximum impact at the pilot hospital. Based on these efforts, it was determined that the transitions-of-care pharmacists' greatest impact after discharge would be in the care of patients who managed their medications in the home setting or at an assisted living facility. By focusing on this patient population, the transitions-of-care pharmacists are able to answer patient questions, reduce medication errors, assist with obtaining medications, and optimize regimens. The original pilot program did not align with the HRRP because it was focused on the population of patients who had been considered to be at high risk for readmission per assessment with an internal risk stratification tool. Based upon this tool, eligibility criteria for the initial phase were payer agnostic and targeted adult patients who had specific disease states (HF, COPD, AMI, diabetes mellitus [DM], and PNA), who had a high medication burden (which was defined as chronic use of 6 or more medications), who were prescribed a high-risk medication (an anticoagulant medication, an antiarrhythmic medication, a hypoglycemic medication, or a Beers criteria-listed medication) or for whom there was concern for readmission, such as admission due to a medication concern, laboratory abnormality, or nonadherence. The service model included 2 "touch points": a telephonic follow-up call within 1 week of discharge and another call 3 weeks after discharge.

The pilot project was designed as a pre- and postimplementation observational cohort study, in which patients were matched from the year prior to program implementation by diagnosis, age, and nursing unit to those who were enrolled in the PTOC program the following year during the same time period. The results of the pilot project are shown in [Table 1](#).

*Phase 2.* With the success of the pilot project, it was determined that there was value in expanding this service across all hospitals in the health system. Four pharmacist FTEs were added to the team. At this time, the challenge

**Figure 1.** Program development timeline for Baycare Health System's Pharmacy Transitions of Care (PTOC) program.



was creating a new practice model and determining how a total of 6 FTEs could successfully impact all hospitals to achieve the success of the phase 1 pilot. A hub-and-spoke model in which the 6 pharmacists were strategically located at the 4 largest hospitals in the health system and remotely serviced the others was developed.

Clinical services remained consistent, with continued use of the 2 telephonic touch points. However, the patient population was shifted to better align with HRRP patient populations of focus. Eligibility for the PTOC program shifted to include Medicare beneficiaries 65 years of age or older who were discharged to a home setting or assisted living facility with a core-measure disease state (as listed above). The 6 pharmacists were able to identify 93% of patients and reach 63% ( $n = 3,711$ ) for at least 1 follow-up call.

Data were analyzed by comparing the 30-day readmission rate for patients who were enrolled in the program and completed at least 1 follow-up call (the PTOC group) to those who were eligible for but not enrolled into the program (the non-PTOC group) and therefore not served by a PTOC

pharmacist. There were 3,711 patients in the PTOC group and 2,160 patients in the non-PTOC group. Use of the program was associated with an absolute readmission risk reduction of 13.69% and a relative risk reduction of 64%. These results are shown in [Figure 2](#).

**Phase 3.** In BayCare Health System, providers perform discharge medication reconciliation within the electronic medical record (EMR) without pharmacist involvement. As part of phase 3 of the project, a new process was developed to require pharmacist involvement in discharge medication reconciliation in order to increase medication safety and optimize drug therapy selection. Pharmacists place recommended discharge medications into a “planned state” prior to physician review and approval. This practice was pilot tested for 8 months at 2 hospitals, a large suburban hospital and a small rural hospital. In combination, pharmacists made a total of 47,918 medication recommendations to physicians, with a 96% acceptance rate.

Recognizing the value of this new service, the team expanded the patient population to include all traditional Medicare patients age 65 or older. It was decided that all such patients would

receive discharge medication reconciliation services, and patients discharged home or to an assisted living setting would also receive follow-up calls. The PTOC team then performed an analysis of the Medicare population and determined that 13 additional pharmacist FTEs, or a total of 23 FTEs for the service line, would be needed. Based on previous phases, the pharmacy team determined that each pharmacist can care for about 2,000 patients per year, with the capacity to provide external consults and cross-coverage of vacations and holidays. This expansion also allowed for a decentralization of pharmacists at additional hospitals so that all but 2 locations would have an on-site pharmacist.

#### **Current service description.**

The current TOC service can be seen in [Figure 3](#). The service has been active across the health system since September 2018 and is currently staffed by 23 FTEs Monday through Friday from 7 AM to 5 PM.

**Pharmacist practice model.** Each hospital has a pharmacy technician–driven admission medication reconciliation process, an inpatient pharmacist team, and transitions-of-care pharmacists. In

**Table 1.** 30-Day Readmission Rates for Patients Enrolled in PTOC Program Pilot Project

Group	Preimplementation Group <sup>a</sup>			Postimplementation Group <sup>b</sup>			P Value <sup>c</sup>
	n	No. Readmissions	Readmission Rate, %	n	No. Readmissions	Readmission Rate, %	
Total	776	123	15.9	608	55	9.0	<0.001
AMI	73	13	17.8	143	6	4.2	0.001
CHF	257	46	17.9	223	26	11.7	0.056
COPD	217	37	17.1	114	13	11.4	0.173
DM	105	11	10.5	77	5	6.5	0.349
PNA	124	16	12.9	51	5	9.8	0.560

Abbreviations: AMI, acute myocardial infarction; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; DM, diabetes mellitus; PNA, pneumonia; PTOC, Pharmacy Transitions of Care program.

<sup>a</sup>The preimplementation group included patients discharged during the 6-month period from August 17, 2014, to February 13, 2015.

<sup>b</sup>The postimplementation group included patients who were followed by the PTOC program and discharged during the 6-month period from August 17, 2015, to February 13, 2016.

<sup>c</sup>P value was calculated using a chi-square test.

the emergency department, pharmacy technicians perform the admission medication reconciliation and document it into the EMR. The inpatient pharmacists are responsible for order verification and pharmacokinetic consults. The detailed responsibilities of the transitional care team are described in the following sections. It is important to note that the inpatient and PTOC team communicate as needed, such as when last-minute inpatient medication changes that would impact the discharge medication regimen are made.

*Patient population.* The program enrolls traditional Medicare beneficiaries who are 65 years and older, with the exception of patients who are discharged to hospice care or expire prior to discharge. Detailed demographic data for each patient have not been collected up to this point. Patients are identified using a daily hospital census report generated from the EMR. Pharmacists track patients' daily and review charts to determine their clinical status and readiness for discharge.

*Discharge medication reconciliation.* When a patient is nearing discharge (ie, an estimated 24 to 48 hours before the anticipated day of discharge), the pharmacist begins the discharge medication reconciliation process. The pharmacist performs a chart review to determine the optimal medication regimen for each patient from both safety and optimization perspectives. Each chart review may take 5 to 10 minutes, with an additional 5 to 10 minutes to perform the discharge medication reconciliation itself, depending upon the complexity of the patient case. Pharmacists perform about 8 of these assessments per day (either prospectively or retrospectively). Prospective medication reconciliation involves placing the recommended discharge medication list in a "planned" or "pending" state within the EMR prior to the physician finalizing the orders. Retrospective reconciliation is defined as reviewing the discharge medication reconciliation results after the physician has signed the medication orders but prior to discharge. The goal is to perform these assessments retrospectively; however,

both methods provide opportunity for the pharmacist to intervene to address any medication concerns and optimize therapy prior to hospital discharge. The pharmacist uses a note within the EMR medication reconciliation screen to communicate additional recommendations to the provider and leave contact information. Pharmacists also call physicians to discuss opportunities for

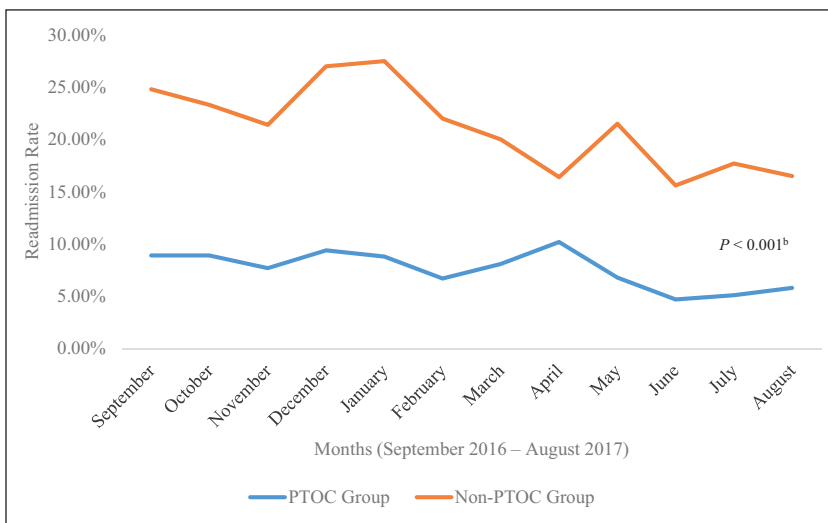
regimen optimization, especially in the scenario of a retrospective review, as physicians may not always see the medication reconciliation note in those cases.

**Telephonic follow-up calls.** For patients discharged home (including those with home health services), the pharmacist performs at least 1 follow-up call within a week of discharge. This call consists of a targeted medication review in

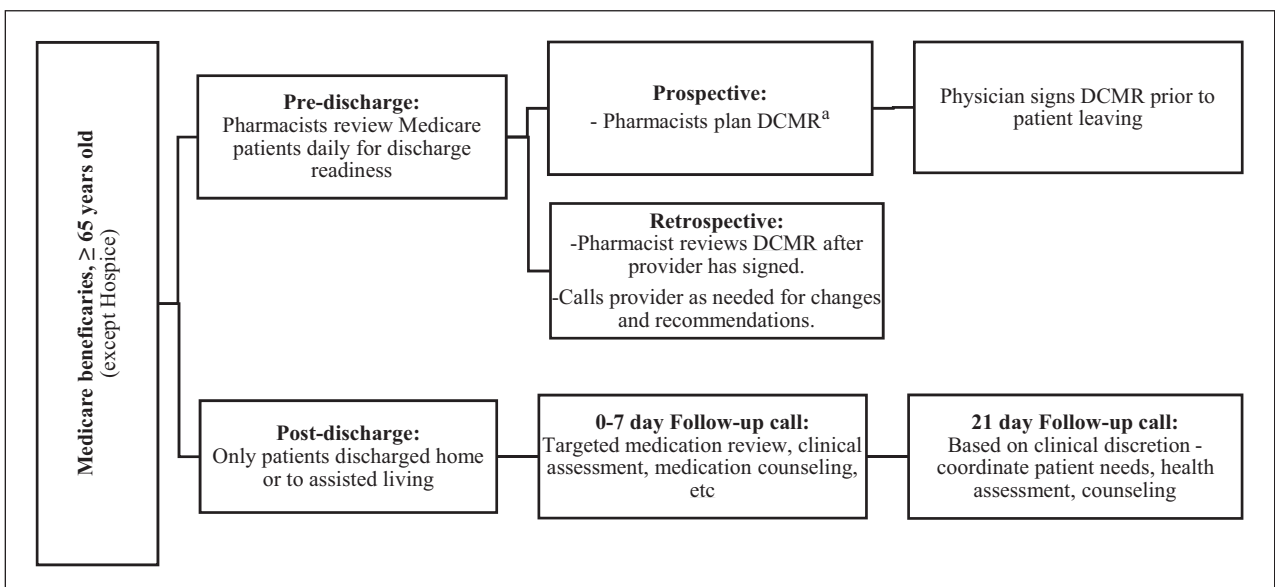
which the pharmacist reviews all new medications, medication questions, and medication concerns. Pharmacists ask clinical assessment questions and counsel the patient on disease state management and medications. A second follow-up call is made on a discretionary basis to patients with a need for further pharmacist intervention or who request additional outreach. All interventions are documented in a clinical note within the EMR.

**Outcome tracking and analysis.** The primary outcome is the 30-day readmission rate, stratified by service level: patients who receive at least 1 service (medication reconciliation or follow-up call) and those who receive both services. Performance is analyzed by comparing the observed rate of re-admission and the expected rate of re-admission, called the O/E ratio. An O/E value of less than 1 demonstrates better-than-expected outcomes. The expected rate of readmission is calculated by the health system automatically within the EMR on the basis of risk factors within patient-specific data. These risk factors include age, acuity, use of high-risk medications such as an anticoagulants or insulin, utilization of the emergency department, number of inpatient stays

**Figure 2.** All-cause 30-day readmissions among patients in the Pharmacy Transitions of Care (PTOC) group and those not receiving PTOC services (the non-PTOC group). *P* value was calculated using Fisher's exact test.



**Figure 3.** Current provision of services in Baycare Health System's Pharmacy Transitions of Care program. DCMR denotes discharge medication reconciliation.



within 6 months, and comorbidities. The observed rate is the actual rate of readmission for the patient population. The patient identification rate, as well as the rate of physician acceptance of discharge medication reconciliation recommendations, is also tracked.

The first 4 months of data (for September through December 2018) demonstrated consistent outcomes. For discharge medication reconciliation, the service sustained a 95% acceptance rate for medication recommendations provided by pharmacists. During this time frame, 9,676 patients (90.6% of the Medicare population) received at least 1 PTOC service, with an O/E ratio of 1.01; 3,881 patients received both services, with an O/E ratio of 0.77. These results are promising given the proximity to program expansion (ie, only 4 months of data were available). Although approximately 40% of the target population received both services, the O/E ratio demonstrates the impact that multiple “touches” by a pharmacist can have on 30-day readmission prevention. The reported O/E ratio for the group receiving at least 1 service includes patients who were discharged to a higher level of care, such as skilled nursing facility (SNF) or acute care hospital care. These patients are not currently served by a pharmacist in the postacute care setting (ie, they do not receive a postacute care phone call), which suggests a potential future opportunity.

## Discussion

BayCare Health System successfully created a PTOC service model that consistently demonstrated statistically significant outcomes in terms of 30-day readmission rates across hospitals of varying sizes and populations. The program’s success can be attributed to deliberate design, continuous outcomes tracking, and workflow optimization.

As mentioned previously, it is well established in the literature that medications are a common cause of 30-day readmissions among the Medicare population. Pharmacists can be

integrated into the transitions-of-care space in a variety of ways; however, resource allocation and use of efficient workflow seem to be suboptimal or underreported.

### Limitations and challenges.

The PTOC program faced challenges related to patient capture, patient engagement, physician buy-in, and EMR capabilities.

Data to stratify between medication reconciliation only vs telephone call only have not been tracked up to this time. Additionally, a future direction would be to stratify between prospective vs retrospective medication reconciliation to see if there is a difference in impact between these populations.

Capturing patients was an initial challenge due to 2 main factors. The first was identifying patients for the program, because there was no efficient way to capture patients while in the hospital to determine eligibility (including factors such as insurance and documentation of a core-measure diagnosis). Historically, pharmacists manually monitored the census and performed chart reviews for all patients admitted, which took several hours per day. This was overcome by collaborating with the technology department and generating a daily census report filtered according to patient-specific demographics. The second factor was inability to predict final diagnoses, which made proactive risk stratification challenging and resulted in missed patients. By expanding the population to include all diagnoses, the program eliminated both challenges and maintained a high capture rate.

Patient engagement has been a challenge for the PTOC program (the overall call acceptance rate is 65%). A patient is often exposed to a number of calls from other postacute care services personnel working on other transitions-of-care teams. Therefore, patients’ willingness to engage with the PTOC program is potentially decreased. There is often difficulty reaching some patients due to their attending follow-up appointments or not picking

up the phone and/or calling pharmacists back. As demonstrated, telephonic follow-up has been shown to reduce readmission rates in the PTOC program; therefore, ensuring that the pharmacy team is able to contact patients is key. To overcome this barrier, pharmacists have utilized home health care (HHC) personnel to assist with reaching patients. A majority of core-measure patients are sent home with orders for HHC services due to a risk of readmission and, unless refused by the patient, receive such services. HHC personnel typically call a pharmacist during their visits to ensure that the patient talks to the PTOC team.

Initial implementation of discharge medication reconciliation as part of discharge planning was difficult due to inconsistent physician buy-in. The role of a pharmacist in discharge medication reconciliation is to limit medication discrepancies, promote medication safety, and increase efficiency for providers. Some providers struggled to understand how a pharmacist could support the discharge planning process, and others questioned how the communication logistics between a physician and pharmacist would work within the discharge medication reconciliation process. These challenges were overcome by enlisting physician champions to support the service, attending physician meetings to describe the program prior to implementation, creating “job aids” for quick reference, and utilizing notes in the medication administration record listing the responsible pharmacist’s phone number and a description of the recommendations made. The program also tracked the rate of physician acceptance of pharmacist recommendations, with prescribers agreeing with the pharmacist’s discharge medication recommendations more than 95% of the time.

Finally, limitations of EMR functionality as it relates to planning for medication reconciliation were identified as a result of pilot testing the service. One of the largest challenges was that discontinued medications

automatically disappear from the medication reconciliation documentation within the EMR after 24 hours when left in a pending state. It was also discovered that transfer medication reconciliation cannot be performed if discharge medication reconciliation has been started. The team managed to work around these obstacles by performing daily assessments of all planned medication reconciliations and devised workflow to revert medication reconciliation documentation to active status if there is an emergent procedure or change in level of care.

**Future directions.** Over the last 4 years, the PTOC program has grown in terms of size and scope of service. The program now serves more than 90% of all traditional Medicare patients across 15 hospitals in the Tampa Bay area. The impact on physician efficiency and patient outcomes has created opportunities for this program to expand beyond Medicare and potentially serve patients of all payer types.

One of the biggest opportunities identified is with patients discharged to SNFs, since this is a population who are often readmitted. In our current service model, patients with a final disposition to an SNF only receive medication reconciliation services from a pharmacist. Therefore, the team is exploring

strategies to have an additional touch point with SNF patients, either while they are in the SNF or after discharge (if they are admitted for acute rehabilitation). Another potential opportunity is bedside medication counseling. While labor intensive, that service may improve medication adherence and increase patient acceptance of postdischarge telephone calls. Some pharmacists have taken pharmacy students and residents on PTOC rotations intermittently; however, this does not provide standard or full-time support. Once learners are trained properly, using them consistently may be an opportunity to extend the “bandwidth” of the PTOC program. Finally, future plans for data analysis include comparisons of outcomes of prospective vs retrospective discharge medication reconciliation.

### Conclusion

For the past 4 years, the PTOC program has leveraged the talent and expertise of clinical pharmacists to improve patient outcomes. The service has been scaled to successfully serve all hospitals within the system and sustain a reduction in all-cause 30-day readmission rates.

### Disclosures

The authors have declared no potential conflicts of interest.

### References

- Centers for Medicare and Medicaid Services. Hospital Readmissions Reduction Program (HRRP). <http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html>. Accessed January 16, 2019.
- Rau J. Medicare eases readmission penalties again safety-net hospitals. Kaiser Health News Web site. <https://khn.org/news/medicare-eases-readmissions-penalties-against-safety-net-hospitals/>. Accessed March 1, 2019.
- Forster AJ, Murff HJ, Peterson JF et al. The incidence and severity of adverse events affecting patients after discharge from the hospital. *Ann Intern Med*. 2003;138:161-167.
- Forster AJ, Clark HD, Menard A et al. Adverse events among medical patients after discharge from hospital. *CMAJ*. 2004;170:345-349.
- National Transitions of Care Coalition. Improving transitions of care: the vision of the national transitions of care coalition. <http://www.ntocc.org/Portals/0/PDF/Resources/PolicyPaper.pdf>. Published May 2008. Accessed March 1, 2019.
- American Society of Health-System Pharmacists, American Pharmacists Association. ASHP-APhA medication management in care transitions best practices. [http://media.pharmacist.com/practice/ASHP\\_APhA\\_Medicatio nManagementinCareTransitionsBestPracticesReport2\\_2013.pdf](http://media.pharmacist.com/practice/ASHP_APhA_Medicatio nManagementinCareTransitionsBestPracticesReport2_2013.pdf). Published February 2013. Accessed March 1, 2019.