

Impact of Pharmacist Transitions of Care on 30-Day Readmissions Within a Primary Care-Based Accountable Care Organization

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Previous studies in the ambulatory care setting have shown inconsistent results in regard to, or with respect to pharmacist telephonic transitions of care (TOC) encounters and reduction in 30-day readmission rates. No studies that have been completed within an accountable care organization (ACO) evaluating the impact of telephonic TOC encounters performed by a pharmacist have been identified. The objective of this study was to analyze the impact of clinical pharmacy telephonic TOC encounters on readmission rates within a primary care-based ACO. In this retrospective chart review, data for those who had a pharmacist telephonic TOC encounter and those who had an attempt were collected. The primary outcome of this study was all-cause 30-day readmission rate. Secondary outcomes included 30-day readmission rate for targeted disease states, time to readmission, and readmission

reason the same as previous discharge reason. For subjects who received a telephonic TOC encounter, pharmacist intervention type and provider acceptance of intervention(s) were described. For the final analysis, 154 encounters were included, 83 encounters in the telephonic TOC encounter group, and 71 did not receive a telephonic TOC encounter. The 30-day readmission rates were similar among those who received a telephonic TOC encounter and those who did not: the difference was not significant (15.7% vs. 28.2%; $P = 0.059$). There was also no statistical difference in the secondary outcomes. Even so, the results of this study suggest that performing a pharmacist telephonic TOC encounter in a primary care-based ACO setting has the potential to reduce 30-day readmission rates and further research appears to be warranted in this important area of practice.



KEY WORDS: Accountable care, Pharmacist, Primary care, Readmissions, Transitions of care.

ABBREVIATIONS: ACO = Accountable care organization, CMS = Centers for Medicare and Medicaid Services, ED = Emergency department, EMR = Electronic medical

record, HRRP = Hospital Readmissions Reduction Program, PCMH = Patient-centered medical home, PCP = Primary care provider, TOC = Transitions of care.

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Introduction

Transitions of care (TOC) is the movement of patients between health care settings.¹ Annually, the cost of readmissions is estimated to be \$17 billion with 20% of Medicare beneficiaries readmitted within 30 days.^{2,3} These readmissions can result from medication-related issues, including drug-related problems, drug-drug interactions, and adverse drug reactions.^{2,3} As medication experts, pharmacists can prevent readmissions through identifying adverse drug events and drug-related problems, providing discharge counseling, and performing a medication reconciliation during a TOC visit, which is further enhanced when the pharmacist works in collaboration with the health care team.^{4,5}

To reduce avoidable hospital readmissions, the Centers for Medicare and Medicaid Services (CMS) implemented the Hospital Readmissions Reduction Program (HRRP) in 2012. HRRP reduces hospital payment for excess readmissions related to acute myocardial infarction, chronic obstructive pulmonary disease, heart failure, pneumonia, coronary artery bypass graft surgery, or elective primary total hip arthroplasty and/or total knee arthroplasty.⁶ CMS has also launched new payment models, including fee-for-service and value-based care, which have created accountable care organizations (ACOs) and patient-centered medical home (PCMH) delivery models.⁵ Similar to HRRP, one of the target outcomes for ACOs is to prevent hospital readmissions, which can be achieved through effective TOC.⁷ With a shift in health care reimbursement from traditional delivery models to value-based care models, providers may miss reimbursement opportunities if they fail to meet specific performance metrics. These metrics include patient engagement, health outcomes, readmission rates, and clinical efficiency.

Pharmacists in the primary care setting are in a unique position to perform TOC services because of their access to the electronic medical record (EMR), established relationships with patients, and

engagement of collaborative practice with providers.⁵ Typically, these encounters are done in person; however, limitations to in-person TOC encounters include space requirements for the visit, increased time commitment for the patient, and transportation barriers. Additionally, the advent of the coronavirus 2019 (COVID-19) pandemic has promoted the use of remote services. Though pharmacist-run TOC initiatives have been explored in large health systems and shown to be beneficial, evidence is lacking in primary care-based ACOs.⁸ Studies evaluating the impact of in-person TOC encounters within an ACO have been evaluated, and revealed pharmacy TOC services may be beneficial.⁹ However, there have been limited studies evaluating the impact of telephonic TOC encounters in the primary care setting, and no studies have been developed within an ACO. The objective of this study was to analyze the impact of clinical pharmacy telephonic TOC encounters on readmission rates within a primary care-based ACO.

Methods

Practice Description

This study was conducted in three ACO primary care offices in South Florida, including a total of eight providers (four primary care physicians, three physician assistants, and one advanced practice registered nurse). In July 2019, a clinical pharmacist was hired to assist with population health management initiatives across the ACO, including telephonic TOC encounters, diabetes management, medication adherence phone calls, and high-cost medication management. Beginning in August 2019, telephonic TOC encounters were conducted by the clinical pharmacist and two PGY2 ambulatory care residents. The clinical pharmacist was provided with a daily list of discharged patients from the primary care provider (PCP). The pharmacist would attempt the first call within 24-48 hours of discharge and no later than 1 week with a total of three phone call attempts. These phone calls lasted between 30 minutes and 1 hour depending on the complexity of the patient case. The pharmacist reviewed the patient's disease



states, laboratory findings, medications, and hospital discharge documents in the EMR. The pharmacist would complete a medication reconciliation, provide appropriate counseling if indicated, and document and send recommendations to the provider through the EMR. If patients had a PCP hospital visit scheduled after the telephonic TOC encounter, the patient was reminded of the appointment as well.

Study Design

This retrospective chart review was approved by the Nova Southeastern University College of Pharmacy Institutional Review Board. Patients with any discharge diagnosis were included if they were 65 years of age or older, admitted to the hospital or emergency department (ED) from August 2019 to September 2020, and had a telephonic TOC encounter attempted. Patients were excluded if they were no longer under the care of the PCPs within the three ACO primary care offices, deceased upon discharge, or discharged to skilled nursing facility including a rehabilitation, long-term care, hospice, or other facility outside of the PCP office. Once patients were determined to be included in the study, they were then categorized into two comparator groups: subjects who received a telephonic TOC encounter upon discharge with a pharmacist versus those without a telephonic TOC encounter. Patients were considered as not having a telephonic TOC encounter when they did not answer the phone call after three attempts. Data collected were baseline demographics, information about initial hospital or ED visit, and a Charlson Comorbidity Index was calculated.

Outcomes

The primary outcome of this study was all-cause 30-day readmission rate. For the purposes of this study, a readmission was defined as any hospital admission or an ED visit. Secondary outcomes included time to readmission and readmission reason the same as previous discharge reason. For subjects who received a telephonic TOC encounter, pharmacist intervention type (including but not limited to increase or decrease in dosing, recommend monitoring, discontinuing medication, initiate medication, counseling, improve adherence) and provider acceptance of intervention(s) were described.

Statistical Analysis

Statistical analysis was performed using IBM SPSS version 23 (IBM Corp., Armonk, NY, USA). Count and percent were used to describe categorical variables. Median and interquartile ranges were used to describe

continuous variables. Chi-square test was used to assess the association of study group (intervention versus no intervention) and categorical outcomes. Independent *t*-test was used to test the difference on continuous outcomes across the study group variables. An alpha level of 5% was used.

Results

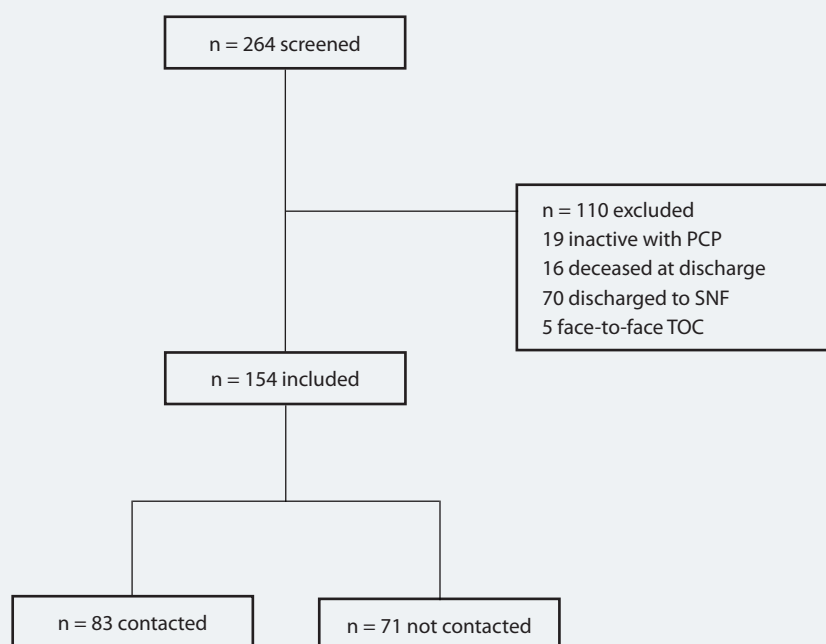
Two hundred sixty-four encounters were screened for inclusion in the study between August 2019 and September 2020. Of those, 154 encounters were included in the final analysis, 83 encounters in the telephonic TOC encounter group and 71 did not receive a telephonic TOC encounter. The remaining 110 were excluded. Reasons for exclusion are described in Figure 1.

Baseline and demographic characteristics are in Table 1. The median age of patients was 77 years in the pharmacist intervention group and 75 years in the no pharmacist-intervention group. The majority of patients in each group were male and white. The two groups were similar in all characteristics, except the patients in the pharmacist intervention group had a longer length of stay (3 days versus 2 days; $P = 0.030$), more hospital admissions (88% vs. 70.4%; $P = 0.007$), and more patients with a PCP visit within 14 days (75.9% vs. 57.7%; $P = 0.016$).

Primary and secondary outcomes are in Table 2. The 30-day readmission rates were similar among those who received a telephonic TOC encounter and those who did not: the difference was not significant (15.7% vs. 28.2%; $P = 0.059$). Time to readmission was higher in the pharmacist intervention group compared with the no pharmacist-intervention group, but it was not significant (16 days vs. 6 days; $P = 0.058$).

In those who received a telephonic TOC encounter, 154 interventions were identified and recommended to providers. Of those, 18.8% were to increase or decrease dosing, 5.8% were to recommend monitoring, 8.4% were to recommend discontinuation of a medication, and 18.1% were to recommend initiation of a medication. The remaining interventions included medication and disease state counseling (38.3%) and adherence counseling (9.7%). Of those, 41 of the recommendations were accepted by the provider (Table 3).



Figure 1. Inclusion and Exclusion Criteria

Abbreviations: PCP = Primary care provider, SNF = Skilled nursing facility, TOC = Transitions of care.

Table 1. Baseline Characteristics

	Pharmacist Intervention (n = 83)	No Pharmacist Intervention (n = 71)	P-value
Age in years, median (IQR)	77 (71-83)	75 (69-82)	0.586
Male, n (%)	45 (54.2)	49 (69)	0.061
Race, n (%)			0.682
White	58 (69.9)	47 (66.2)	
Black or African Descent	7 (8.4)	10 (14)	
Asian	0 (0)	1 (1.4)	
Hispanic	10 (12)	9 (12.7)	
Unknown	8 (9.6)	4 (5.6)	
Length of stay in days, median (IQR)	3 (2-5)	2 (1-4)	0.030
Type of initial visit, n (%)			0.007
ED	10 (12)	21 (29.6)	
Admission	73 (88)	50 (70.4)	
Days to pharmacist call, median (IQR)	8 (5-14)	N/A	—
PCP visit within 14 days of discharge, n (%)	63 (75.9)	41 (57.7)	0.016
Days to PCP visit, median (IQR)	5 (3-7)	5 (3-7)	0.849
CCI, median (IQR)	6 (5-8)	6 (3.5-7)	0.156

Abbreviations: CCI = Charlson Comorbidity Index, ED = Emergency department, IQR = Interquartile range, PCP = Primary care provider.



Table 2. Primary and Secondary Outcomes

	Contacted (n = 83)	Not Contacted (n = 71)	P-value
30-day readmission rate, n (%)	13 (15.7)	20 (28.2)	0.059
ED visits, n (%)	5 (6)	3 (4.2)	
Hospital readmissions, n (%)	8 (9.6)	17 (23.9)	
Time to readmission in days, median (IQR)	16 (6-21)	6 (4-15.5)	0.058
Readmission reason same as previous discharge reason, n (%)	0 (0)	4 (20)	0.085

Abbreviations: ED = Emergency department; IQR = Interquartile range.

Table 3. Medication-Related Issues Identified by Pharmacist TOC Calls

	Pharmacist-Identified Interventions, n (%)	Provider Acceptance of Intervention, n (%)
Total	154	41
Increase or decrease in dosing	29 (18.8)	15 (51.7)
Recommend monitoring	9 (5.8)	6 (66.7)
Discontinuing medication	13 (8.4)	6 (46.2)
Initiate medication	28 (18.1)	12 (42.9)
Counseling	59 (38.3)	–
Improve adherence	15 (9.7)	–

Abbreviation: TOC = Transitions of care.

Discussion

This study investigated the impact of a pharmacist telephonic TOC encounter in a primary care-based ACO setting on 30-day readmission rates. Primary and secondary outcomes were not significantly different. The low sample size may have reduced the chance of detecting a true effect. It is possible that with more study participants and greater statistical power, a difference might have been demonstrable. Nevertheless, the patients in the pharmacist intervention group had a longer length of stay and more hospital admission, possibly meaning that the patient had advanced disease or reason to go to the hospital leading to greater potential of readmission.

Previous studies in the ambulatory care setting have shown inconsistent results in pharmacist telephonic TOC encounters and reduction in 30-day readmission rates. One study showed a reduction in 30-day readmissions in those who received in-

person pharmacy services versus those who did not.¹⁰ Additional studies, which looked at a combination of in-person and telephone TOC, showed mixed results with a nonsignificant trend toward less 30-day readmissions with pharmacist intervention. Anderson and colleagues showed a significantly reduced rate of 30-day readmissions with pharmacist telephonic TOC encounters compared with those who did not receive a pharmacist telephonic TOC encounter in a PCMH.¹¹ However, Kilcup and colleagues also evaluated pharmacist telephonic TOC encounters in a PCMH and showed no difference on 30-day readmissions with pharmacist telephonic TOC encounters compared with those who did not receive a pharmacist telephonic TOC encounter.¹²

When compared with previous literature, the population in the current study had a higher age, possibly leading to a higher likelihood of readmission rates. Additionally, the current study did not restrict the inclusion of patients contacted by pharmacist based on disease



state or other criteria, which could have also similarly influenced the results. While previous studies used large teams of pharmacists, the current study used three pharmacists. Finally, unlike previous literature, this study was conducted during the COVID-19 pandemic, which may have impacted the results of the study. Important to note, none of these studies were performed in the setting of a primary care-based ACO. As such, the current study adds to the limited data available. The ACO setting is unique in that the pharmacist had access to impact patients from various practices while also indirect contact with providers. By completing telephonic TOC encounters, pharmacists are also able to help meet ACO measures related to TOC, including completing a medication reconciliation post-discharge. The possibility of inclusion bias also cannot be discounted, as the means for allocation to the two arms of the study are based in ability/inclination to answer the attempted telephone contact.

Provider acceptance of pharmacist recommendations was low in the study, possibly because of limited time of primary providers, variability in trust from providers, and documentation of recommendations through EMR as opposed to verbal recommendations. In order to have an effective pharmacist-led TOC program, importance must be placed on fostering a trusting and collaborative relationship. Additionally implementing a collaborative practice agreement can be a strategy to optimize the TOC process, reducing medication errors, and preventing adverse events. Additionally, there was a lower percentage of patients who had a discharge diagnosis included in the HRRP diagnoses in the no pharmacist-intervention group when compared with the pharmacist-intervention group. Patients may be admitted to the hospital for a variety of reasons, at times unrelated to medication issues. However, future studies continue to evaluate the optimal patient populations on which pharmacists can have the strongest impact during TOC.

Some benefits of telephonic TOC encounters include the ability to contact the patient multiple times if needed, less resource and space requirements, and convenience for the patient. Additionally, during the study period COVID-19 was declared a global pandemic and impacted many aspects of life and health care, specifically the expansion of telehealth services. COVID-19 could have impacted the results as well. Patients may not have been going to the hospital or their PCP as much to avoid potential exposure to COVID-19. Additionally, pharmacists in clinics may not have been able to perform for face-to-face visits. This

study shows an example of how TOC services can be delivered remotely using telehealth.

Some limitations of this study include limited sample size, limited geographic area, and study duration. The generalizability of this study is also limited to those insured with access to specialists and facilities. The impact of a pharmacist telephonic TOC encounter may be greater in those with limited access to health care. Despite these limitations, the current study is the first specifically focusing on pharmacist telephonic TOC encounters completed in a primary care-based ACO.

Conclusion

Though there were no observable differences on readmission rates, pharmacists performing telephonic TOC encounters in the primary care-based ACO setting have the potential to provide needed interventions to the health care team. Studies with a large population size and longer study duration are needed to fully evaluate the impact of pharmacists' telephonic TOC medication-related interventions in the primary care setting.

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