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## Evaluation of a Discharge Clinic Implemented for Patients Without a Primary Care Provider or Access to Their Primary Care Provider

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Evaluation of a Discharge Clinic Implemented for Patients Without a Primary Care  
Provider or Access to Their Primary Care Provider

Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Nursing  
Practice at the University of Kentucky

By

Jessica Sass

Lexington, KY

2023

## Abstract

**Background:** Patients transitioning from an inpatient hospital stay to self-care responsibilities post-discharge are at risk for readmission resulting in increased cost and resource utilization. Care transition programs can result in cost avoidance and decreased resource utilization.

**Purpose:** The purposes of this project were to: (a) determine if implementation of a Discharge Clinic affected 30-day readmission rates in patients without a primary care provider, (b) ascertain if a visit by a paramedicine program paramedic impacted 30-day readmission rates in patients who missed their Discharge Clinic appointment, and (c) find out whether a second post-discharge phone call influenced 30-day readmission rates.

**Method:** A single-center, retrospective exploratory design was employed in this study. Participants included discharged patients (N=727) from a hospital inpatient stay without a primary care provider or without access to their primary care provider who were scheduled for a Discharge Clinic care transitions appointment. Data was collected from November 2021 to November 2022 to determine the impact of a Discharge Clinic visit on 30-day readmission rates. Patients were either called by a transition of care nurse or visited by a paramedicine paramedic following their Discharge Clinic appointment and further data analysis (Chi-Square, Logistic Regression) included whether or not these interventions impacted 30-day readmission rates.

**Results:** The overall sample size for this study was 727 patients. Readmission rates were 17.7% (n=452) for those who completed a discharge appointment, compared to 24.7% (n=275) for those who did not. Participants who completed their Discharge Clinic appointment received a follow-up call after their appointment. Those participants who completed this call had a 4% readmission rate compared to 26% for those who did not ( $p<.001$ ). Participants referred to the paramedicine program had a lower readmission rate (11.1%) compared to those who were not referred (24.9%,

$p=.251$ ). A completed Discharge Clinic follow-up appointment resulted in 34% lower odds of readmission ( $OR = 0.64$ , 95% CI = 0.44 – 0.92,  $p = .017$ ).

**Conclusion:** A completed Discharge Clinic appointment was effective in reducing 30-day readmission rates as was a second TOC call. The community paramedicine program collaboration showed promise in reducing 30-day readmission rates although further research is needed. Identifying interventions that improve 30-day readmission rates is imperative for improving outcomes, reducing resource utilization, and avoiding penalties in value-based programs.

## **Acknowledgments**

My nursing career has been as diverse as the patients I have had the pleasure to serve. I have been fortunate to work as a registered nurse and a nurse practitioner in various settings with diverse patient populations. These experiences and opportunities helped shape who I am today.

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## **Dedication**

To Chris, Andrew and Logan Sass, Kathy Vernon, and friends.

Chris, you have listened, sympathized, empathized, and encouraged me along the way; for that I am grateful. You picked up the slack when I had my head buried in my computer or a book; for that I am grateful.

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Evaluation of a Discharge Clinic Implemented for Patients Without a Primary Care Provider or  
Access to Their Primary Care Provider

**Background and Significance**

Patients transitioning from an inpatient hospital stay to self-care responsibilities post-discharge are at risk for 30-day readmission especially when social drivers of health are not met (Baldino, 2021). Patients often struggle to obtain the required care following an acute illness that would allow them to maintain their existing level of health (Schaeffer, 2017). The Centers for Medicare and Medicaid Services (CMS) estimates 30-day readmissions cost \$17 billion annually, which is significant when considering most 30-day readmissions are avoidable (Jencks, 2009). Chakravarthy (2018) determined a three times higher rate of 30-day readmissions among Medicare and Medicaid patients when they did not attend a transition of care appointment.

Hospital 30-day readmissions result in increased cost and resource utilization as well as a decreased quality of life for the patient. These patients are at higher risk of adverse health outcomes and are admitted to the hospital more frequently (Boyd, 2010) and only 55% receive appropriate care (Ward, 2013). The complexity and intensity of interventions for patients with multiple chronic conditions represent a challenge (Baldino, 2021; Vogel, 2007). Care transition programs can result in cost avoidance of nearly \$4000 per patient over six months while decreasing acute healthcare resource utilization (Gardner, 2014). However, programs designed to improve care following acute illness have varied outcomes and the effectiveness of the program often depends on the targeted population and the intervention (Rennke, 2013).

A systematic review of patient-centered multi-morbidity care indicated asynchronous care focused on patient-centered interventions (self-management, education, skills, provider training, care/case management) had the potential to positively impact chronic disease outcomes

(Poitras, 2018). The greatest potential for improvement of primary and secondary outcomes in older adults with multi-morbidities was seen in care coordination interventions focused on how, who, when, and where healthcare is organized and delivered (Baldino, 2021; Kastner, 2018). A scoping review of effective elements in patient-centered care among patients with co-morbidities indicated that innovative programs positively affect health-related outcomes (Poitras, 2018). Overall, findings support collaborative care as a promising approach for managing and improving chronic disease outcomes and resource utilization, especially when focused on symptom reduction and preserving the quality of life (Baldino, 2021; Kastner, 2018). With the transition to value-based care, organizations must embrace care redesign to improve care delivery and healthcare savings.

A transitions of care (TOC) model implemented in a Family & Community Medicine (FCM) clinic at the University of Kentucky Healthcare (UKHC) showed a reduction in 30-day readmission rates among those patients attending a TOC appointment (Ballard, 2018). The TOC program provided patients discharged from the hospital with a 48-hour phone call to bridge the gap between hospital care and follow-up care in the clinic. This phone call addressed medication changes and a medication review, upcoming appointments, any new or continuing symptoms, and helped to further coordinate care. The clinic's TOC program further discovered that patients without a primary care provider or an external (outside the UKHC system) primary care provider were at greater risk of 30-day readmission than those patients who had a primary care provider at UKHC (Setser & Wade, 2021). The success of this program and the knowledge gained from data analysis paved the way for the implementation of a Population Health Service (October 2020) (Ballard, 2018; Setser & Wade, 2021) and a subsequent Discharge Clinic (November 2021) at UKHC. The Population Health Service was then able to scale the FCM's TOC program as a

systemwide Population Health Service to provide services to the rest of the adult primary care clinics in UKHC.

Along with TOC programs, community paramedicine programs have emerged across the United States (and other countries) to address the need for healthcare reform, especially among vulnerable populations (Chan, 2019; O’Meara, 2016). Community paramedicine programs expand the role of paramedics beyond emergency response and transport and have the potential to reduce the utilization of emergency departments and 30-day readmission rates. These programs also serve as a community liaison between the patient, community resources, and the healthcare system. Paramedics are trusted healthcare providers within communities which allows for a community-driven approach (Chan, 2019; O’Meara, 2016).

### **Purpose / Objectives**

The purposes of this project were to determine if the implementation of a Discharge Clinic improved 30-day readmission rates in patients who did not have a primary care provider or did not have access to their primary care provider, whether a visit from the community paramedicine program paramedic impacted 30-day readmission rates in patients who missed their Discharge Clinic appointment, and whether a second post-discharge phone call from a licensed practical nurse affected 30-day readmission rates. The key objectives encompassed:

- 1) Evaluate patients with an appointment in the Discharge Clinic (completed visit vs no show) at 1- year post-implementation and determine if a completed Discharge Clinic appointment improved 30-day readmission rates for those patients compared to those who did not attend their Discharge Clinic appointment.
- 2) Determine whether collaborating with the community paramedicine program to visit those patients in the community who did not attend their Discharge Clinic

appointment impacted 30-day readmission rates compared to those who did not attend their Discharge Clinic appointment and were not visited by the community paramedicine program.

- 3) Determine whether a completed second TOC phone call to patients following their completed Discharge Clinic appointment (approximately 7-10 days later) affected 30-day readmission rates compared to those who completed their Discharge Clinic appointment but did not complete a second TOC call.

### **Literature Review**

An extensive literature search was completed to evaluate whether implementing a discharge clinic affected 30-day readmission rates in patients without a primary care provider or access to their primary care provider. Both CINAHL and PubMed databases were used to complete the search and key terms included: care transition, implementation, outcomes, readmission, adults, transition clinic, and post-discharge. Through rapid critical appraisal (RCA) (Melnyk & Fineout-Overholt, 2019), six articles were chosen based on their specific focus of a discharge clinic. Exclusion criteria included any studies focused on a disease state including behavioral health conditions, studies related to follow-up in a primary care setting, and any articles before 2012. These six articles were analyzed for a better understanding of current evidence and gaps in knowledge.

A theme of decreased 30-day readmission rates emerged when a patient was seen in a discharge clinic (Chakravarthy, 2018; Baldino, 2021; Otsuka, 2019; Baldwin, 2018; Griffin, 2021; Tak, 2021) as did a theme of increased risk of 30-day readmission when patients did not attend a discharge clinic appointment (Baldino, 2021; Chakravarthy, 2018; Otsuka, 2019). Most of the clinic designs included a team-based care approach and employed varying teams including

a provider, registered nurse, social worker, medical assistant, clinical pharmacist, and patient navigator (Chakravarty, 2018; Baldino, 2021; Baldwin, 2018; Griffin, 2021; Otsuka, 2019). Chakravarty (2018) and Tak (2021) included Medicare patients in their study participant group (Chakravarty, 2018; n = 1149); Tak (2021) also included Medicaid patients (n = 583,199). The other studies included all payers with sample sizes ranging from n=75 (Baldwin, 2018) to n=1373 (Baldino, 2021). The hospital settings included an academic medical center (Chakravarty, 2018; Baldino, 2021; Otsuka, 2019), a Veteran Affairs Hospital (Griffin, 2021), and not-for-profit hospitals (Baldwin, 2018).

Despite the difference in insurance, sample size, and setting, all studies showed an improved 30-day readmission rate when patients attended a discharge clinic appointment (Chakravarty, 2018; Baldino, 2021; Otsuka, 2019; Baldwin, 2018; Griffin, 2021; Tak, 2021). One similarity included the focus on team-based, interprofessional care (Chakravarty, 2018; Baldino, 2021; Baldwin, 2018; Griffin, 2021; Otsuka, 2019). Nevertheless, the strength of the evidence needs to be considered. Of the six studies, three were observational studies (prospective, retrospective) (Otsuka, 2019; Baldwin, 2018; Tak, 2021), two were cross-sectional studies (Chakravarty, 2018; Baldino, 2021) and one was a quality improvement initiative (Griffin, 2021). While the strength of these studies was limited due to their non-experimental designs, they did help determine limitations and gaps in knowledge.

Not identifying confounding variables and not including admissions outside of their healthcare system when determining 30-day readmission rates were limitations of these studies (Chakravarty, 2018; Baldino, 2021; Otsuka, 2019; Baldwin, 2018; Griffin, 2021; Tak, 2021). Another limitation was the lack of generalizability due to either single-center studies or the exclusion of certain insurance types (Tak, 2021; Griffin, 2021; Chakravarty, 2018). A patient's

interaction with a healthcare facility before the index admission was not assessed making it difficult to determine if low versus high utilization was a factor in 30-day readmission rates (Chakravarthy, 2018). Other gaps in knowledge included, “does having an appointment scheduled before discharge affect a patient’s likelihood of attending a discharge appointment” or “does a patient’s engagement in care affect 30-day readmission rates” (Baldwin, 2018; Tak, 2021). An additional question was, “for those patients who did not show up to the discharge clinic appointment were social drivers of health a factor”? A reduction in the 30-day readmission rate is a measure of success but correlating which interventions reduced 30-day readmissions and which population becomes valuable in determining the success and sustainability of a program (Griffin, 2021; Chakravarthy, 2018; Otsuka, 2019).

### **Theoretical / Conceptual Framework**

The impact of the Discharge Clinic was evaluated using the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework (Glasgow, 1999). The RE-AIM framework is used to guide planning and evaluation. Since the introduction of the RE-AIM framework in 1999, it has gone through many iterations and is now focused on the sustainable adoption of programs through effective, generalizable, and evidence-based implementation of interventions. To that end, the RE-AIM framework helps translate research into action by using five outcome measures (reach, effectiveness, adoption, implementation, and maintenance) (RE-AIM, 2022). These outcome measures were used to evaluate whether the 30-day readmission rate improved following implementation of the Discharge Clinic.

## **Methods**

### **Design**

This was a single-center, retrospective exploratory study focused on 30-day readmission rates for adult patients. Evaluation of the 30-day readmission rate for the Discharge Clinic included the timeframe of November 2021 to November 2022.

### **Setting and Participants**

This study took place at University of Kentucky HealthCare (UKHC) which is a large academic medical center located in central Kentucky. More specifically, patients discharged from two hospitals associated with UKHC (Chandler and Good Samaritan) and scheduled an appointment in the Discharge Clinic (a satellite clinic) were the focus of this study. The Discharge Clinic was designed to provide a centralized location for hospital follow-up for those patients who did not have a PCP or access to their PCP. Patients referred to the Discharge Clinic typically were at higher risk of 30-day readmission based on Epic's Risk of Unplanned Readmission risk score of 14 or greater (Hwang, 2021). The Discharge Clinic employs one physician, two nurse practitioners, two registered nurses, two medical assistants, and a clinic manager. The clinic can see approximately fifty patients per day and offers a comprehensive hospital follow-up visit that can include lab and imaging services, wound care, intravenous treatment (fluids, diuresis, antibiotics, etc.), breathing treatments, spirometry, etc.

The focus population for this study included adult patients without a primary care provider or patients without timely access (within 7-14 days post-discharge) to their primary care provider for a hospital discharge follow-up appointment who were scheduled for an appointment in the UKHC's Discharge Clinic. Patients were not excluded based on gender, race, or ethnicity. Patients referred to the Discharge Clinic typically had a 30-day readmission risk score of 14 or

greater, but patients with a lower risk score were also included if they were scheduled for an appointment in the Discharge Clinic. The total number of patients scheduled in the Discharge Clinic for a TOC appointment between November 2021 and November 2022 was 727. This number included only those patients that attended (arrived) or did not attend (no showed) their TOC appointment.

### ***Congruence of Project***

This project aligned with UKHC's mission, vision, and 2025 strategic plan which includes creating a healthier Kentucky by advancing care delivery, focusing on patients, and reducing healthcare costs. To that end, UKHC participates in several value-based payment programs that look at 30-day readmission rates as a quality measure. These value-based programs either penalize or provide incentive payments for meeting national benchmarked 30-day readmission rates (CMS, n.d.). Implementation of a Discharge Clinic was an evidence-based care delivery model designed to improve patient outcomes, reduce 30-day readmissions as well as reduce overall spending. The evaluation of the Discharge Clinic, using the RE-AIM framework, helped determine if the intended outcomes were met.

### ***Stakeholders***

There were several stakeholders associated with this evaluation project. The Discharge Clinic taskforce learned ways to improve the clinic moving forward. UKHC senior leadership learned if their investment in a Discharge Clinic provided the proposed return on investment (ROI), both monetary and patient outcomes. Patients benefited from the clinic in terms of having a place to receive hospital follow-up care, but they also benefited from identified areas of opportunity. Those who were hired to work in the Discharge Clinic were stakeholders as they



had a vested interest in seeing this clinic sustained over time. Inpatient staff and providers were also stakeholders as they had easy access to a post-discharge follow-up option. Lastly, other healthcare centers were stakeholders as the knowledge gained from this evaluation could guide the implementation of a Discharge Clinic at their facility.

### ***Facilitators and Barriers (site-specific)***

There were several facilitators and barriers to this project. The first facilitator was the ability to obtain the majority of the data set from the Performance Analytics Center of Excellence (PACE). This limited the need for chart reviews and the merging of data sets. This also allowed for the congruence of 30-day readmission data with nationally benchmarked data which improved the ability to generalize the results to other similar programs. Another facilitator was having an integrated electronic medical record across the enterprise. This allowed the majority of the work related to patient care to be captured in one system and improved the congruence of the data collected. The last facilitator of this project was the support of senior leadership. Barriers were also identified to include the lag in data related to 30-day readmissions and, while limited, there was still the need for chart review which was time-consuming. Another barrier included the changes in workflows that occurred during the first year making it hard to discern initial workflows from the current state and which changes may have affected outcomes. Lastly, the full extent of the Return on Investment (ROI) was difficult to determine as just assessing 30-day readmission rates is one of many variables considered when determining ROI.

## **Procedure**

### ***Institutional Review Board***

Institutional Review Board (IRB) approval from the University of Kentucky was obtained for this study on August 5, 2022. A modification review related to study personnel and data collection was requested on January 10, 2023, and approved on January 27, 2023.

### ***Intervention***

In November 2021, UKHC opened the Discharge Clinic, which provides patients who do not have a primary care provider or access to their primary care provider a centralized location for a hospital discharge follow-up within 7-14 days. The Population Health Service expanded its TOC program to the Discharge Clinic at that time. Approximately six- and ten months post-go-live of the Discharge Clinic, quality improvement initiatives were implemented to further help reduce 30-day readmission rates. These quality improvement initiatives expanded a collaboration the University of Kentucky had with the community paramedicine program as well as expanded the role of the Population Health Services' TOC program.

The Discharge Clinic, designed to provide care to those patients at a higher risk of 30-day readmission, found some of the highest-risk patients were missing their TOC appointments. UK Healthcare's Population Health Service decided to collaborate with the community paramedicine program to improve outcomes for high-risk patient populations. The Population Health Service referred patients who missed their TOC Discharge Clinic appointment to the community paramedicine program. The community paramedicine team visited these patients in the community to determine further needs of the patient and to help with care coordination activities. This quality improvement initiative started in May 2022.

Patients seen in the Discharge Clinic were experiencing long wait times to establish with a primary care provider or see their primary care provider potentially increasing their risk for 30-day readmission. Patients receiving a TOC call from the Population Health Service were enrolled in the TOC program for 30 days which created an opportunity for a second quality improvement initiative. The Population Health TOC program started calling patients 7 - 10 days after their completed Discharge Clinic appointment to continue care coordination services. Three attempts were made to reach the patient on different days and at different times throughout the day. This allowed for the continued care of patients while they awaited primary care provider follow-up. This quality improvement initiative started in September 2022.

### ***Data collection***

Participants were identified by a report generated from Epic (the electronic medical record) which showed patients who had a scheduled TOC appointment in the Discharge Clinic between November 2021 and November 2022 as well as appointment outcomes for those appointments. The Epic report was further broken down into those patients who completed a Discharge Clinic visit and those patients who did not attend their appointment; meaning they were a no show. The Performance Analytics Center of Excellence (PACE) team (with UKHC) pulled a list of patients with 30-day readmissions between November 2021 and November 2022 from the Vizient website. The PACE team then provided the principal investigator with a merged list of patients scheduled in the Discharge Clinic, appointment outcome, and whether or not the patient had a subsequent 30-day readmission. This report also included demographic information (age, gender, race, ethnicity, and insurance coverage) for analysis purposes. The data that was collected for the quality improvement initiatives including: (a) patients who had a community paramedicine program visit and (b) patients who had a second hospital discharge follow-up

phone call, was added to the PACE report by the PI. Consent was not obtained from the study population as the need for consent was waived by the IRB.

### ***Data analysis***

Descriptive statistics were used to analyze age, gender, race, ethnicity, and insurance coverage. Descriptive statistics also were used to describe the rate of 30-day readmission and completed vs. no-show visits. This allowed for a baseline 30-day readmission rate for those patients who completed a TOC visit and those who did not attend their TOC visit. These baseline results were used to compare 30-day readmission rates for the quality improvement initiatives as well. The collected data was analyzed in a deidentified manner using Chi-Square, Fisher's Exact Test where appropriate to determine if there was an association between a Discharge Clinic visit and 30-day readmission, a second post-discharge clinic appointment phone call and 30-day readmission rates for those patients who attended their Discharge Clinic appointment, and a paramedicine visit and 30-day readmission rates for those patients who did not attend their Discharge Clinic appointment. Following, multiple linear regression modeling was used to evaluate the association between Discharge Clinic visit completion and 30-day readmission, adjusting for gender, race/ethnicity, and payor status. SPSS version 27 was used for data analysis and statistical significance was considered with a p-value less than or equal to .05.

### **Results**

The mean age of the participants was 53.49 (SD 15.75) with the majority being male (58.7%), white (71.4%), and Non-Hispanic (92.4%) (see Table 1). Medicaid was the largest payer source (46.4%) followed by Medicare (33.9%) and commercial sources (13.7%). Only 4.5% were self-pay.

For the 727 patients who had scheduled appointments in the Discharge Clinic, 452 patients (62.2%) completed their appointment while 275 patients (37.8%) did not complete their appointment (see Table 2). One hundred forty-eight (20.4%) of 727 patients scheduled for a Discharge Clinic appointment were readmitted within 30 days of discharge while 579 (79.6%) did not experience a 30-day readmission.

For patients who completed a Discharge Clinic appointment (n=452), 17.7% were readmitted within 30 days compared to 24.7% for those who did not complete their Discharge Clinic appointment (n=275; p=.022; see Table 3). A bivariate analysis demonstrated that the only variable significantly associated with readmission status was appointment outcome (p=.023). In the logistic regression model, adjusting for gender, race, ethnicity, and payor sources, those who completed the Discharge Clinic appointment had 34% lower odds of readmission compared to those who did not complete the Discharge Clinic appointment ( $OR = 0.64$ , 95% CI = 0.44 – 0.92,  $p = .017$ ).

From September 2022 to November 2022, TOC calls were initiated for patients who had completed a Discharge Clinic appointment (n=144). This second TOC call was completed for 53 patients (36.8%) while 91 (63.2%) did not answer the second TOC call. For those patients who completed a second TOC call, there was a 4% readmission rate compared to 26% for those who did not complete a second TOC call (p<.001).

Between May 2022 through November 2022, a community paramedicine home visit was implemented for those patients who did not complete a Discharge Clinic visit (n=187). Of the 187 patients who did not complete a Discharge Clinic appointment, 18 patients (9.6%) were referred to the paramedicine program and received a home visit while 169 (90.4%) were not

referred. The readmission rate for those patients visited by the community paramedicine program was 11.1% compared to 24.9% for those not seen by the paramedicine team (p=.251).

## **Discussion**

The purposes of this study were to determine if a completed appointment in the Discharge Clinic affected 30-day readmission rates and to identify other interventions that may lead to improved 30-day readmission rates. The Discharge Clinic was designed to provide a centralized location for hospital follow-up for those patients who did not have a PCP or timely access to their PCP. Referral criteria to the Discharge Clinic targeted high-risk patients admitted to the hospital. Hence, patients referred to the Discharge Clinic typically were at much higher risk of 30-day readmission based on Epic's Risk of Unplanned Readmission risk score of 14 or greater compared to the general admitted patient population (Hwang, 2021). This suggests a higher complexity of patients, as does the propensity for not having a PCP or access to their PCP for discharge follow-up (Setser & Wade, 2021).

The results from this study provide preliminary evidence that completing an appointment in the Discharge Clinic improves readmission rates for high-risk patients. It is important to note this high-risk patient population generally has a higher 30-day readmission rate than the general population prompting referral to the Discharge Clinic. The readmission rate for completed Discharge Clinic appointments was 17.7%. which was lower than the 24.7% readmission rate for those patients who did not complete a Discharge Clinic appointment. Data analysis showed statistical significance for a reduction in 30-day readmissions when a patient completed their Discharge Clinic appointment. Additionally, a completed Discharge Clinic appointment was the only variable significantly associated with reducing 30-day readmission. This finding was

consistent with previous studies (Ballard, 2018; Chakravarthy, 2018; Baldino, 2021; Ostsuka, 2019; Baldwin, 2018; Griffin, 2021; Tak, 2021).

Eighty percent of the patient population had either Medicaid (46.4%) or Medicare (33.9%) which increases the risk of 30-day readmission (Chakravarthy, 2018) as does their risk for social drivers of health (Baldino, 2021). Payer source, race, nor ethnicity had a significant impact on 30-day readmissions in this study. Regardless of age, gender, payer source, race, or ethnicity, patients who completed their Discharge Clinic appointment had 34% lower odds of 30-day readmission. Ballard et. al. (2018) reported similar findings regarding age, but Chakravarthy (2018) reported patients with Medicare or Medicaid had 3 times higher odds of readmission.

The complexity of the patient population and potential fallout, however, led to the implementation of two interventions; referral to the community paramedicine program and a second post-visit TOC call. Results showed an increased risk for 30-day readmission (24.7%) for patients who did not complete a Discharge Clinic appointment warranting further intervention. Since paramedics are trusted by community members, collaborating with the community paramedicine program provided further care coordination opportunities (Chan, 2019; O'Meara, 2016). Unfortunately, the referrals to the community paramedicine program were limited by the capacity of the program to take on added patients. The 30-day readmission rate for patients seen by the community paramedicine program was lower (11%), although, this was not statistically significant. Further data collection and analysis are needed to determine if this intervention truly has the potential to impact 30-day readmission rates in this patient population. Nevertheless, the findings from this study suggest that traditional hospital follow-up may not be the only way to reduce hospital readmissions.

The second intervention consisted of a second TOC call 7 – 10 days after the completed Discharge Clinic appointment. Schaeffer (2017) stated patients struggle to obtain needed care post-hospitalization and the second TOC call allowed care coordination efforts to continue between the Discharge Clinic appointment and the next follow-up appointment. Results showed a readmission rate of 3.8% for this patient population. It is worth noting only 37% of the patients were reached for a second TOC call. This speaks to the challenges Baldino (2021) and Vogel (2007) shared in past research regarding how to determine the needed level of complexity and intensity of interventions. While 63% of the patients did not answer the second TOC call, the 3.8% reduction in 30-day readmissions was statistically significant implying interventions focused on how, who, when, and where healthcare is organized and delivered have the greatest potential to improve outcomes (Baldino, 2021; Kastner, 2018).

### **Implications for Practice, Research, Policy, and Education**

Based on the findings of this study, there are implications for practice that warrant consideration. An example would be to expand the collaboration with the community paramedicine program. While a visit from the community paramedicine staff member did not result in a statistically significant reduction in readmissions, it did show promise in reducing 30-day readmission rates. Expanding this pilot by providing capacity for the community paramedicine program to accept more referrals could determine whether future collaboration with the community paramedicine would improve 30-day readmission rates.

Another consideration for practice would be to determine whether to continue the second TOC call. While the second TOC call resulted in a statistically significant reduction in readmissions, only 37% of the patients were reached which means 63% were not reached. This is a large number, but considering the reduction in readmission rate, it makes sense to continue this



work until other interventions are vetted. One such intervention to consider is text messaging in addition to phone calls. Further research could be conducted to determine if more people or certain patient populations are reached by adding text messaging capability. Further analysis could determine whether or not text messaging affects the ability to reach patients for a second TOC call and subsequent 30-day readmission rates. Ideally, a patient's preferred method of communication would be assessed at registration and used as the patient's chosen method of communication.

Future research on the Discharge Clinic patient population should also address the following (a) social drivers of health, (b) whether the follow-up appointment should be made before or after discharge from the hospital, (c) the timeframe for the follow-up appointment, (d) the impact of an initial TOC call (made within 48 hours of discharge), (e) the patient's level of engagement in their care, (f) the patient's prior interaction with the healthcare system, and (g) PCP status to determine if these factors affect appointment outcome and 30-day readmission rates. A completed appointment in the Discharge Clinic had a statistically significant impact on reducing readmission rates so determining the root cause of the 37.8% who did not complete their Discharge Clinic appointment might be valuable in determining interventions that could reduce the no-show rate for the Discharge Clinic and subsequently improve 30-day readmission rates.

Along with practice and research implications, this study may have policy implications. With more than 80% of a person's health outcomes affected by social drivers of health, patient care requires a switch in focus from traditional "clinical care" to a focus on social, economic, and environmental factors (Houlihan & Leffler, 2019; Ndugga & Artiga, 2021). Addressing social drivers of health starts with screening patients for social drivers of health. The screening must

then be followed by the ability to provide the appropriate intervention based on the patient's specific need (Jain 2020). Universal screening and documentation of social needs would help with data collection and identification of patient needs. For example, this data may help determine the root cause of the 37.8% no-show rate in the Discharge Clinic. This data and analysis of data could help determine the extent social drivers of health have on health outcomes as well as the complexity of patients served by health systems. This knowledge could drive policy changes regarding upstream interventions and funding of programs that address social drivers of health. It could also drive policy change regarding how value-based programs penalize or incentivize organizations that are addressing the social drivers of health versus solely based on meeting certain quality metrics (Bensken, 2021).

This study also proposes a shift in nursing education. Value-based care necessitates a curriculum redesign to include care redesign, system innovation, and value-conscience care (Pittman, 2021). Historically, nursing programs have focused on learning to execute orders in the hospital and other traditional care settings. Nurse educators should also focus on teaching nursing students to evaluate, critique, and redesign paying particular attention to population health and health systems equipping them to succeed in and lead programs that reduce cost through operational improvement.

Being able to translate findings into action is imperative as the healthcare landscape continues to change. Value-based programs focus on prevention and care coordination. Implementing asynchronous care that includes collaboration across intra and interprofessional teams focused on patient-centered interventions has the potential to improve access to preventive services and positively impact chronic disease outcomes. Population health interventions also have the potential to provide efficient and effective care that addresses upstream barriers to

providing care in the least restrictive and least expensive manner. This shift in care delivery can also reduce resource utilization and lower overall healthcare costs (Houlihan & Leffler, 2019; Landau, 2019; Kangovi, 2020; Pittman, 2021).

Finances are a significant focus for organizations. Value-based care programs have called for action related to reducing the cost of healthcare. CMS estimated 30-day readmissions cost \$17 billion annually and UKHC was able to estimate that preventing 30-day readmission could result in a cost avoidance of \$11,000. The TOC program is a revenue-generating program that can offset the cost of employing nurses who make the TOC calls. Further data analysis could help determine the full extent of the ROI. Knowing a completed TOC appointment is a significant factor in reducing 30-day readmission rates future research should focus on determining why 38% of the patients no-showed their appointment. This could lead to further cost savings and an overall reduction in healthcare costs.

### **Limitations**

This was a single-center, retrospective study which limits the ability to generalize the findings to other locations. The patient population was not comprised of patients with a specific disease state but included all co-morbidities, making it hard to translate these findings to specific disease states or patient populations. The fact that the Discharge Clinic typically sees high-risk patients also decreases the ability to generalize results to the general patient population. The sample size for the community paramedicine intervention was too small for statistical significance. Sample sizes for both the community paramedicine program and the second TOC call were too small to run logistical regression to establish possible associations. Additionally, several patients were lost to follow-up which may have skewed the data. This study also did not identify 30-day readmissions to other hospitals outside of the organization which may have

impacted 30-day readmission rates. It was noted some emergency room patients were being scheduled as hospital follow-ups in the Discharge Clinic and these patients may have inadvertently been included in the data set for analysis. Lastly, some patients who completed a Discharge Clinic appointment were scheduled for another follow-up appointment in the Discharge Clinic which may have affected the overall 30-day readmission rate for the second TOC call intervention.

### **Conclusion**

A completed Discharge Clinic appointment was effective in reducing 30-day readmission rates as was a second TOC call. The community paramedicine program collaboration showed promise in reducing 30-day readmission rates although further research is needed. This study also indicated asynchronous patient-centered interventions focused on how, when, and where care is delivered have the potential to reduce readmission rates. A reduction in the 30-day readmission rate was a measure of success, but further research is needed to determine which interventions have the greatest impact. Identifying interventions that have the greatest impact and improve 30-day readmission rates is imperative for improving outcomes, reducing resource utilization and healthcare costs, and avoiding penalties in value-based programs.

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Table 1. Demographic Summary of Discharge Clinic (N = 727)

Variable	Mean (SD) or n (%)
Age	53.49 (15.75)
Sex	
Male	427 (58.7%)
Female	300 (41.3%)
Race	
Black or African American	167 (23%)
White	519 (71.4%)
Other	41 (5.6%)
Ethnicity	
Hispanic	53 (7.3%)
Non-Hispanic	672 (92.4%)
Declined to Answer	2 (.3%)
Payor	
Commercial / Private	100 (13.7%)
Medicaid	337 (46.4%)
Medicare	246 (33.9%)
Self-Pay	33 (4.5%)
Other	11 (1.5%)

Table 2. Appointment Outcomes and Readmissions of Discharge Clinic (N=727)

Variable	n (%)
Appointment Outcome	
Completed	452 (62.2%)
No Show	275 (37.8%)
Readmissions	
Not Readmitted	579 (79.6%)
Readmitted	148 (20.4%)

Table 3. Readmission Rates of Discharge Clinic

	Readmitted	Not readmitted	<i>p</i>
Discharge clinic appt status (n=727)			.022
Completed	80 (17.7%)	372 (82.3%)	
No show	68 (24.7%)	207 (75.3%)	
Among No Show (n = 187)			.251
Paramedicine Visit	2 (11.1%)	16 (88.9%)	
No Paramedicine Visit	42 (24.9%)	127 (75.1%)	
Among Completed (n = 144)			<.001
Follow-up Call	2 (3.8%)	51 (96.2%)	
No Follow-up Call	24 (26.4%)	67 (73.6%)	