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Review Article

Transition Coach Program Implementation Associated with Thirty-Day Readmission Rates in a Community Hospital Setting

Abstract

Background: With implementation of Medicare policies affecting reimbursement for readmissions, there has been increased emphasis on quality of care during transition from hospital to home. Several models for improved care, such as utilization of transition coaches, have developed to address barriers to quality healthcare that are prevalent in this care transition.

Objective: To study the effect of implementation of a transition coach program on thirty-day readmission rates in a community setting serving a predominantly low-income patient population.

Design: Retrospective cohort study. 30-day readmission rates of control group were compared to group receiving transition coach services.

Setting: 189-bed community hospital.

Patients: Medicare or dually-eligible patients admitted between 2/1/12 and 1/31/14.

Intervention: Intervention group received transition coach services, including inpatient assessment, at-home assessment and medication reconciliation, and telephone-based follow-up in the thirty days following index hospital admission.

Measurements: Data was gathered retrospectively on 30-day readmissions. After adjusting for age, gender, ethnicity, length of stay, and comorbidity, the odds of readmission were then assessed through logistic regression.

Results: After adjusting for age, sex, length of stay, and comorbidity, odds ratio for readmission remained higher for those receiving transition coach services, with 30-day odds ratios of 1.55 (95% CI: 1.15-2.08, p = 0.004) during year one and 1.88 (1.40-2.53, p < 0.001) during year two.

Conclusions: Though limited by design, it did not appear that use of transition coaches among a high-risk elderly population decreased rates of all-cause readmission in this community setting.

Introduction

The turn of the century has seen an intensification of focus on the provision of high-quality, low-cost care. *To Err Is Human* [1], published in 2000, followed by *Crossing the Quality Chasm* [2], served as catalysts for identifying and addressing errors within the US healthcare system.

The transition from hospital to home is a point of care in which barriers to care are prevalent. This is seen especially in the elderly and the chronically ill, for whom decreased capacity for self-care and difficulties with navigating the health system lead to significant challenges [3]. Studies have consistently identified mistakes in several areas, including medication reconciliation [4,5], communication between hospital-based and primary care [6,7], and coordination of follow-up visits [3,8]. Approximately 19% of patients experience adverse events during hospital discharge, with the majority of events related to medications, therapeutic errors, and nosocomial infections [4,5].

In an effort to address these errors, a number of interventions have been proposed that focus on elements of care transition. Interventions have focused on specific diseases, improving care coordination, and enhancing self-efficacy, all with varying degrees of success [9]. Among the most well-studied and efficacious of these is the Care Transitions Intervention [10], whose model has now been implemented in numerous hospital settings throughout the country [11]. Through being assigned a transition coach for a 28-day period, with an overall goal of improving self-management, the intervention showed a sustained decrease in readmission rates to 180 days [10]. Similar programs have been implemented, using a central patient advocate to help with coordination of care, yielding mixed results [12-16].

Section 3026 of the Accountable Care Act of 2010 served to both establish the Community-Based Care Transitions Program and contribute $500 million towards transitional care programs implemented for Medicare beneficiaries. This, as well as Medicare's plan to adjust hospital payment based on 30-day readmission rates, has

led many hospitals to implement programs such as those listed above focusing on enhancing care at hospital discharge. We performed a retrospective cohort study examining 30-day readmission rates after the implementation of transition coaches within a community hospital setting.

Methods

Setting and study dates

This study was conducted at Lawrence General Hospital, a non-profit, private community hospital in Eastern Massachusetts. The hospital cares for patients within Lawrence, a city of 77,326 [17], as well as surrounding counties. Lawrence General Hospital is a 189-bed acute care hospital located in the City of Lawrence, a very low-income, largely Hispanic community 30 miles north of Boston. The vast majority of the patients and 70.5% of the hospital's FY2011 gross patient service revenue come from public payers, and of that 30.4% comes from low income payers, and nearly 8% of that total is care to the uninsured.

Care within the hospital is provided largely by hospital-based clinicians, and also by community-based primary care clinicians and a family practice residency-run inpatient service. Transition coaches were employed by an area non-profit agency serving several area hospitals. Coaches were all licensed social workers who had undergone the Transitions Coach Training Program. The enrollment period took place from 2/1/2012 to 1/31/2014.

Population

All admissions of patients 65 and older with Medicare or dually-eligible insurance status from the above study period were evaluated. Patient data was excluded from the study for the following: 1) patient death, 2) transition to hospice care, 3) transfer to a separate acute care facility, 4) discharge against medical advice, 5) residence outside of the defined service area, and 6) admission for psychiatric or substance abuse diagnosis (Table 1).

Eligibility criteria

Patients had to meet the following criteria to be eligible to take part in the transition coach program: 1) insurance status as Medicare or dually-eligible and 2) residence within the program's catchment area. A floor case manager, after screening for initial eligibility, performed a risk assessment that acted as a proxy for likelihood of readmission. Included in the assessment were the following: 1) history of mental illness/cognitive impairment, 2) issues with health literacy, 3) lives at home with limited/no community support/homebound, 4) requires assistance with medication management/activities of daily living/instrumental activities of daily living, 5) end-stage clinical condition, 6) acute/chronic wound or pressure ulcer, 7) history of falls, 8) prior admission or ED visit within 30 days, 9) decreased adherence to a treatment plan, and 10) polypharmacy. The case manager would communicate the results of this assessment to the transition coach, who would then offer transition coach services to eligible patients.

Intervention

After accepting entry into transition coach program, patients underwent an initial assessment while hospitalized. This included identification of any medication changes that occurred while inpatient, reviewing diagnoses addressed while hospitalized for later monitoring for red flags, establishing a transition record, and addressing issues with transportation. Issues with ability to pay medication and follow-up visit copays were also attended to, with coaches able to pay initial post-discharge copays if a patient were unable, followed by coordination with a counselor to address ongoing prescription coverage. They also assisted in arranging a home health aide and monitoring supplies (e.g., blood pressure cuffs, scales) if deemed necessary.

A home visit was then performed 48-72 hours after discharge. During this visit, the transition coach assisted the patient with medication reconciliation, screened for red flags, and offered referral for a visiting nurse if this was thought to be beneficial. The transition coach also verified that patients had primary care follow-up appointments, and would role play with patients how to troubleshoot making an appointment if any difficulties arose.

This visit was followed by a series of four telephone calls over the 30-day intervention period. Coaches inquired into results of primary care and specialist follow-up, discussed the red flag symptoms for which care should be sought, and answered any remaining questions.

Outcome

Data on demographic information and diagnoses (diagnosis-related groups [DRG] and ICD-9 codes) from index hospitalization was collected through review of admission data within the hospital electronic medical record. DRG and ICD-9 data were then used to calculate a comorbidity score using the Healthcare Cost and Utilization Project's comorbidity software [18].

Data was then gathered on whether or not the index admission was followed by readmission within 30, 90, and 180 days of hospital discharge. Comparison of observed rates of readmission between the intervention and control groups served as the primary outcome for this study.

As a secondary outcome, we assessed the readmission rates for the intervention group during the year prior to study entry, compared to the year following study entry.

Statistical analysis

In the primary analysis, the effects of transition coach utilization on odds of readmission were assessed through logistic regression. Potential confounding variables of age, gender, race, ethnicity, and comorbidity score were included as covariates. Data was evaluated by intention-to-treat analysis, with patients who received transition coaches but did not complete the 30-day program remaining in the intervention group. All regressions were estimated using R software, version 3.0.2.

Results

Statistically significant differences in age, length of stay, and race/ethnicity were observed between the intervention and control groups as outlined below (Table 2). In comparing unadjusted readmission rates for the intervention and control groups during the first and second years of the study, higher rates of readmission for the intervention group were observed consistently within 30 days of
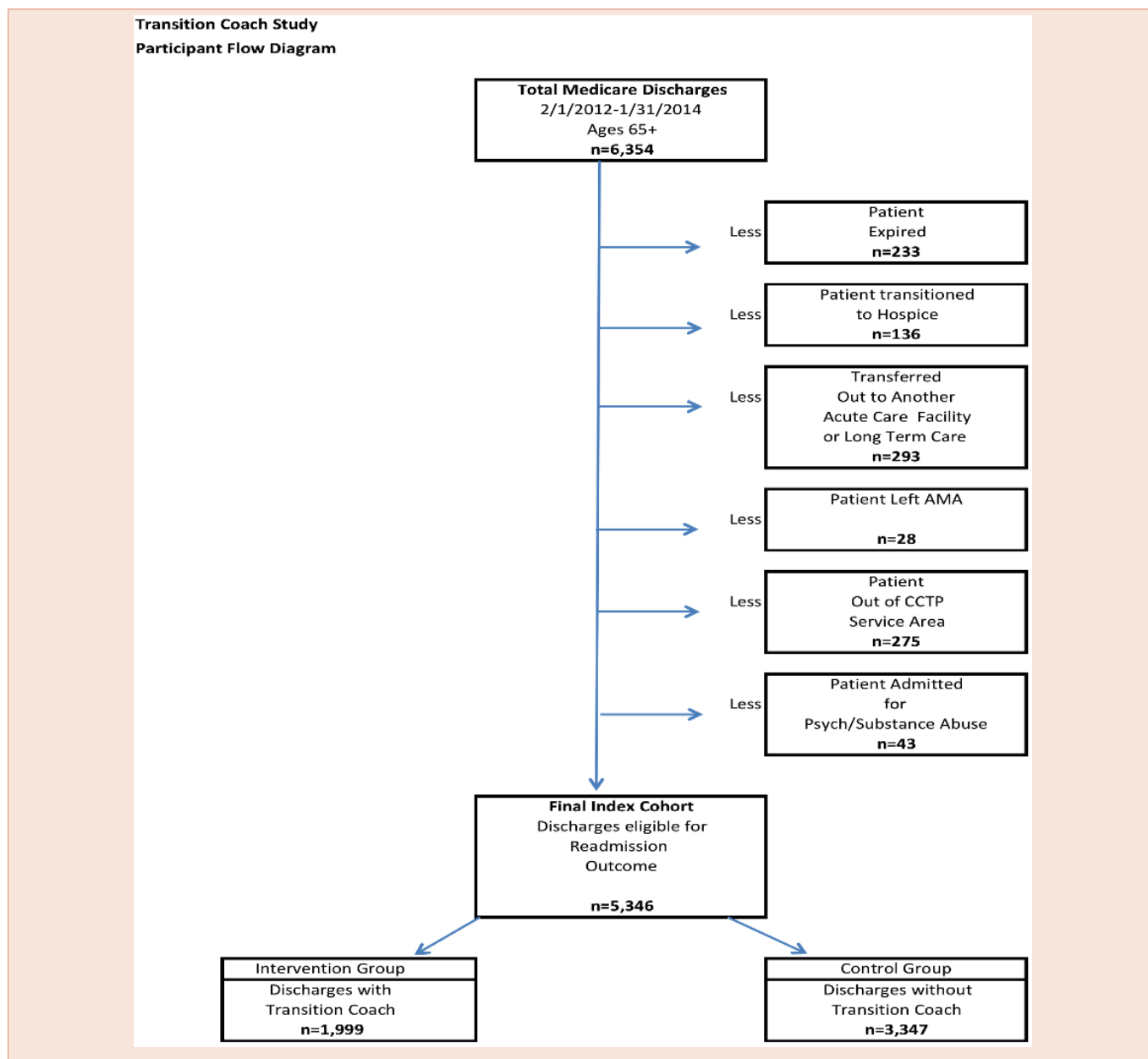
Transition Coach Study
Participant Flow Diagram

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                    ┌─────────────────────────────┐
                    │  Total Medicare Discharges   │
                    │    2/1/2012-1/31/2014        │
                    │        Ages 65+              │
                    │        n=6,354               │
                    └─────────────────────────────┘
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Less → **Patient Expired n=233**

Less → **Patient transitioned to Hospice n=136**

Less → **Transferred Out to Another Acute Care Facility or Long Term Care n=293**

Less → **Patient Left AMA n=28**

Less → **Patient Out of CCTP Service Area n=275**

Less → **Patient Admitted for Psych/Substance Abuse n=43**

Final Index Cohort
Discharges eligible for Readmission Outcome
n=5,346

Intervention Group Discharges with Transition Coach **n=1,999**

Control Group Discharges without Transition Coach **n=3,347**

Table 1: Transition Coach Study, Participant Flow Diagram.

hospital discharge (Table 3). After adjustment for comorbidity, age, gender, length of stay, and ethnicity, these differences persisted, with odds ratios of 30-day readmission for the intervention group of 1.55 (95% CI: 1.15-2.08, p = 0.004) during the first year of the transition coach program, and of 1.88 (1.40-2.53, p < 0.001) during year two (Table 4).

Discussion

This study found that implementation of a transition coach program in this community hospital setting was associated with increased rates of readmission. Results are limited by several factors. As this is a retrospective cohort study, there were confounding factors that were associated with both receiving a transition coach and readmission rates. With patients being selected to engage in the transition coach program in part based on stratification of risk for readmission, it is also likely that there are other patient- and environment-driven factors associated with specific patients for which it is difficult to fully adjust based on diagnosis alone. Patients were also given the option of accepting or rejecting transition coach services based on individual preference, which may have affected the results obtained. As the study was conducted within a single institution, this introduces the possibility that there are institution-dependent factors that may have influenced readmission rates. As with any hospital system, there were concurrent changes being

Table 2: Demographics for all Participant Discharges in the Study   Medicare 65+ Discharges 2/1/12-1/31/14.

Variable	Intervention (n=1,906)	n	Control (n=3,290)	n	Total Sample (n=5, 196)	p for difference
Age, Mean	80.2		79.6		79.8	0.03
Female (%)	62.2	(1,186)	60.4	(1,988)	61.1	0.21
Married	33.5	(638)	36.9	(1,213)	35.6	0.01
Self-Identified race						
White	91.1	(1,736)	93.3	(3,068)	92.5	0
Black	6.7	(127)	4.7	(154)	5.4	0.003
Other race	2.3	(43)	2.1	(68)	2.1	0.72
Self-Identified Ethnicity						
Hispanic/Latino	15.3	(291)	11.6	(383)	13	<0.001
Language						
English	83.6	(1,593)	87.2	(2,868)	85.9	<0.001
Spanish	11.2	(214)	8.1	(265)	9.2	<0.001
Other language	5.2	(99)	4.8	(157)	4.9	0.54
Patient has PCP selected in hospital records	96	(1,830)	92.6	(3,045)	93.8	<0.001
Discharge Diagnosis [1]						
Congestive heart failure	9.8	(187)	5.4	(177)	7.0	<0.001
Pneumonia	5.8	(110)	5.6	(185)	5.7	0.87
Chronic obstructive pulmonary disease (COPD)	6	(115)	3.6	(118)	4.5	<0.001
Cardiac dysrhythmias	5.8	(111)	5.4	(177)	5.5	0.54
Urinary tract infections	4.7	(89)	4.8	(157)	4.7	0.92
Septicemia	3.7	(71)	3.9	(127)	3.8	0.87
Diabetes	1.3	(25)	0.9	(29)	1.0	0.18
Acute myocardial infarction	2.7	(51)	2.7	(90)	2.7	0.97
Index hospitalization Surgical DRG	12.8	(244)	18.1	(595)	16.1	<0.001
Index hospitalization						
Length of Stay (mean)	5.1		4.3		4.6	<0.001
Discharge Destination [2]						
Home	38.5	(733)	49.4	(1,625)	45.4	<0.001
Home with Home Health Care	21.4	(408)	12.5	(410)	15.7	<0.001
Skilled Nursing Facility	27.1	(516)	28.9	(949)	28.2	0.18
Other	13.1	(249)	9.3	(306)	10.7	<0.001
30 Day All-Cause Readmission Rate [3] (2/1/12-1/31/13)	12.5%		7.4%		9.0%	<0.001
30 Day All-Cause Readmission Rate [3] (2/1/13-1/31/14)	12.3%		6.4%		8.8%	<0.001

[1]Based on H-CUP Clinical Classification Software (CCS). Primary Diagnosis

[2] 1 Index Hospitalization per patient per 30-Day Period

[3]CMS Publicly reported definition. The readmission measures count readmission as a "yes/no" outcome regardless of the number of times the patient was readmitted during the 30-Day post-discharge time period. Thus, if a patient has more than one admission within 30 days of discharge from the index hospitalization, this patient's readmission status would be "yes" because there were one or more readmissions within 30 days of being discharged from the index admission. However, once the 30-Day measurement period that is associated with the first index admission has passed, the next eligible hospitalization is considered a new index admission.

Table 3: Unadjusted Readmission Rates

All Cause Readmission Rate - 30D	Intervention Group	Control Group	p for difference
Year One	12.50%	7.40%	<0.0001
Year Two	12.30%	6.40%	<0.0001

Table 4: Adjusted odds ratios for readmission and 95% confidence intervals, comparing intervention group to control group.

	Adjusted Odds Ratio for 30-day readmission
Year 1	1.55 (1.15-2.08; p=0.004)
Year 2	1.88 (1.40-2.53; p<0.001)
Overall	1.53 (1.26-1.86; p<0.001)

*Logistic regression models adjusted for age, sex, ethnicity, length of stay, and comorbidity.

implemented to improve care during the study period, leading to the possibility that readmission rates were affected through other routes. However, these quality improvement projects would be expected to reduce readmission rates irrespective of transition coach status.

Although there are limitations to this study as delineated above, there are still findings worthy of consideration. As hospitals across the country move forward with the implementation of programs meant to improve transitions of care, it is vital to evaluate the effects of these programs outside of the clinical trial setting and to realize that implementation of a specific program's model does not necessarily guarantee a replication of its results.

It is important to consider how populations who receive transitions of care interventions within hospitals implementing these programs

are likely to vary from those studied within clinical trials. In the Care Transitions Intervention, for instance, patients 65 and older were assigned to receive the services of the program at random [10]. This is likely to differ from the way such a program is implemented within individual hospitals, where limited resources are such that they are allocated to those at higher risk. Thus, the pooled effect of enrolling a more general group could dissipate. This, as discussed above, may in part account for why this study did not show a decreased likelihood of readmission for the intervention group. In a broader context, it also serves as a reminder that implementation of these programs in a multitude of clinical settings is likely to yield more varied results when compared to the outcomes seen in the initial studies.

This study also highlights the importance of monitoring a program's success in achieving its desired goals. After implementation in a novel hospital setting, this can be used to revise and eventually improve a program's outcomes. In reassessing the transition coach program one and a half years after implementation, we redesigned our program to help personalize the benefits of transition coach services. As examples, the transition coaches, visiting nurses, and hospital staff meet biweekly to go over specific cases to help maximize any services that might be needed during the transition to home. Transition coaches are now using handheld devices to calculate specific risk scores for particular conditions such as heart failure and pneumonia. This information as well as other questions are then triaged by a coordinating nurse to ensure a higher level of transitional care is provided to the patient upon discharge to home. These newer interventions were started after this study ended and would not have affected the results reported here.

Finally, as has been discussed elsewhere [19], it is worthwhile to reconsider whether 30-day readmission rates are truly an accurate proxy for quality of care. A result of the new Medicare policy, which adjusts reimbursement based on rates of readmission, has been to effectively change readmission reduction from a secondary goal to a primary one. As transition of care interventions become more widespread, it is important to keep in mind that implementation of these models has the potential to increase readmissions, and that this may be a result of the improved quality of care rather than a program's ineffectiveness (via increased access, closer monitoring for red flag symptoms, and more expedient hospital admission for sicker patients). Though it is true that the system must reduce cost to remain sustainable, the merits of interventions such as the one discussed still must lie chiefly in their capacity to address barriers, reduce errors, and improve quality of care. Rather than assume that a transition coach program is unable to reduce readmission rates in our hospital system, the findings from this study have highlighted areas for improvement, in order to achieve higher quality healthcare for our underprivileged patient populations and eventually reducing cost for our healthcare system.

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