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Hospital Readmission and the Value of a Care Transitions Program for the Elderly: A Retrospective Cohort Study

Husnain Syed*, **Christina Chen, Sarah J. Crane, Anupam Chandra, Ericka E. Tung, Gregory J. Hanson, Stephen S. Cha, and Paul Y. Takahashi**

Department of Primary Care and Internal Medicine, Mayo Clinic, Rochester, 200 First Street SW, Rochester, MN 55905, USA

Abstract

Background: Transitional care programs are being established to improve medical care for at-risk adults. Evidence exists that Care Transition Program(s) (CTP) reduce hospital readmissions. We conducted a retrospective cohort study to identify which process measures in our CTP were likely to contribute to a reduction in the 30-day readmission rates.

Methods: At-risk patients were identified and seen soon after the index hospital discharge. Areas of emphasis during these visits included hospital follow-up care, medication reconciliation, and psychosocial aspects of care, among others.

Results: Medication reconciliation was performed in 87%, and an assessment of the psychosocial aspects of care was assessed in 71.7% of the patients.

Discussion: This pilot study of CTP showed promising results of an 11% 30-day readmission rate, compared to a national rate of 19.6%. Further studies that integrate standardized documentation during CTP visits will be important to determine important factors involved in providing better quality of care.

Keywords: Readmissions; Care transitions; Geriatric

Introduction

With the introduction of the Affordable Care Act of 2010, transitional care programs are being established to improve medical care for at-risk adults. These programs aim to improve the care through a timely, comprehensive geriatric evaluation, which will reduce 30-day hospital readmissions. Previous models have used a nurse-practitioner (NP) as the clinical manager of newly discharged patients. These models have been demonstrated to reduce readmissions [1]. Other models have emphasized a standardized checklist of information that is important for a successful hospital transition [2]. These checklists emphasize timely follow-up, medication reconciliation, completing follow-up appointments, and understanding the illness. In our group, we implemented a clinical transitions program (CTP) for vulnerable, elderly patients using an Elder Risk Assessment (ERA) score for patient risk stratification [3]. The primary goal of a CTP is to reduce rehospitalization through principles of effective care transitions based on the best evidence. It is unclear how successful this CTP has been, or which process measures best reduce 30-day rehospitalization. To answer these questions, we conducted a retrospective cohort study to identify which process measures were most likely to contribute to a reduction in the 30-day readmission rates in our vulnerable, elderly patient population.

Methods

Study design

We used a retrospective cohort study design. The Mayo Clinic Institutional Review Board (IRB) reviewed and approved the protocol. Consent was waived by the IRB. The authors conducted all aspects of the research on this project in accordance with the principles of the Declaration of Helsinki.

Patient population and setting

The study was conducted with patients enrolled in CTP in Employee and Community Health (ECH) from December 31, 2010 until October 31, 2011. Patients were impanelled with a primary care physician. The patients were over 60 years of age and had an Elder Risk Assessment (ERA) index score over 16. The ERA index, an administrative health index, included demographic information of date of birth, gender, number of hospital days in the prior 2 years, comorbid medical illness, and marital status. The ERA index predicts hospitalizations, emergency room visits [3] mortality, and nursing home placement [4]. The exclusion criteria included patients enrolled within CTP who did not give authorization for medical record review.

Care transitions program intervention

The CTP enrolled patients had an initial visit by an NP, with subsequent NP visits, or phone calls by a care manager nurse (RN). Primary areas of emphasis included hospital follow-up care and chronic disease management. Specifically, the visit included the following: medication reconciliation, patient understanding of medical condition(s) and medications, presence of a caregiver, assessment of depression, debility, functionality, need for physical therapy, advanced care directives, and psychosocial aspects of care. We set a clinical benchmark of 90% for process measures. Subjects for this study specifically had a hospitalization during the time ranges of the study.

*Corresponding author: Husnain Syed, Department of Geriatrics, Mayo Clinic, 200 First Street SW, Rochester, MN 55905, USA, Tel: (507)-284-2511; Fax: (507)-284-5414; E-mail: syed.husnain@mayo.edu

Outcome assessment

The primary outcome included a 30-day rehospitalization following an initial index hospitalization. We reviewed medical records to identify the initial CTP visit, and the number of hospital and emergency room visits before and after the index CTP encounter. We assessed the time (in days) from the hospital discharge to a CTP visit, and time (in days) to hospital readmission from prior hospital admission. CTP process measures included medication reconciliation, presence of caregiver, functional status assessment, psychosocial assessment, depression, and advanced-care planning during the initial CTP visit.

Statistical analysis

The descriptive results are reported as percentages, means with standard deviations, or medians with quartile ranges. A univariate analysis (Pearson chi-square or t-test) was done to determine if any of the aspects of CTP (listed above) were significantly associated with a reduction in either 30-day or 180-day readmissions. A multivariate logistic model was performed to find predictors for readmission. A P value of less than 0.05 was considered significant. Power was not calculated prior because of the pilot nature of the study.

Results

Demographics

Of the 75 initial records, 45 patients were eligible for inclusion (had an index hospital stay and a CTP visit). The average age was 86 ± 6.9 years with 76.1% over the age of 80. The average number of days in the hospital prior to CTP was 7.2 ± 5 days, with an average number of hospital diagnoses on admission of 8.2 ± 3.8 illnesses. The median number of days from dismissal to CTP encounter was 13.5 (IQR 3 to 27 days), with up to 61% of patients seen within 7 days of hospital discharge. Five of the 45 subjects were readmitted within 30 days (11%).

None of the process measures achieved a clinical benchmark of 90%. Medication reconciliation was performed in 87.0% of patients, with one or more medication changes made in 34.8%. Medication compliance was reported in 45.7%, and the presence of a pill box was found in only 8.7%. Functional debility was seen in 65.2%, with activities of daily living assessed in 82.6%. A formal physical therapy evaluation post-hospitalization was found in 26.1%. An assessment of the psychosocial aspects of care (access to health care, social network, family and financial concerns and dynamic) was assessed in 71.7% of patients. The full findings of the process and outcome measures are noted in Table 1. After the initial evaluation, we created odds ratios for significant predictors and created a multivariable model analysis. Previous hospital admission(s) and emergency department visits seen within 7 days, along with psychosocial screening conducted during the CTP visit, were initially significant on univariate analysis, but only psychosocial screening remained significant using multivariable analysis (Table 2).

Variable	Overall		No 30 day re-adm		30 day re-adm		P-Value
	(N=45)		(N=40)		(N=5)		
Age at CTP	85.67	± 6.95	86.35	± 6.35	80.2	± 9.83	0.06
los = DischargeDt - AdmissionDT	7.02	± 5.21	7.2	± 5.47	5.6	± 2.07	0.52
Number of hospital diagnosis	8.07	± 3.70	8.08	± 3.77	8	± 3.46	0.97
Days from dc to CTP visit	24.22	± 35.63	26.48	± 37.13	6.2	± 7.82	0.23
Hospital stays previous year	0.93	± 1.32	0.78	± 0.92	2.2	± 2.95	0.021
ED visits per year	1.53	± 2.03	1.3	± 1.44	3.4	± 4.51	0.027
Number of medications	13.27	± 5.30	13.28	± 5.50	13.25	± 3.10	0.99
Number of medication changes	0.67	± 1.26	0.7	± 1.32	0.4	± 0.55	0.62
Process Measures (yes answers) (%)							
Seen within 7 days	17	(38)	13	33%	4	(80)	0.039
Caregiver	25	(56)	22	55%	3	(60)	0.83
Medication reconciliation	39	(87)	35	88%	4	(80)	0.64
Medication changes	16	(36)	14	35%	2	(40)	0.83
Med compliance	21	(47)	20	50%	1	(20)	0.2
Pill box	4	(9)	4	10%	0	(0)	0.46
Understand medications	7	(16)	7	18%	0	(0)	0.31
Advanced directives	12	(27)	12	30%	0	(0)	0.15
Understand illness	11	(24)	9	23%	2	(40)	0.39
Follow up tests	20	(44)	17	43%	3	(60)	0.46
Functional debility	29	(64)	25	63%	4	(80)	0.44
ADLs assessed	37	(82)	32	80%	5	(100)	0.27
PT evaluation	12	(27)	9	23%	3	(60)	0.07
Depression	11	(24)	11	28%	0	(0)	0.18
Psychosocial evaluation	32	(71)	31	78%	1	(2)	0.007

ADLs = activities of daily living, adm = admission, dc = discharge, Dt = date, ED = emergency department, los = length of stay, PT = physical therapy

Table 1: Demographic and Process Measures for 45 Patients in Care Transitions Program.

Parameter	Odds Ratio	95 % CI		P-value
		Lower	Upper	
Predict 30 day readmission				
Hospital stays previous year	2.129	0.336	13.473	0.4223
ED visit previous year	0.782	0.224	2.724	0.6992
Psychosocial evaluation	0.095	0.007	1.245	0.073

Table 2: Multivariate analysis of CTP variables.

Discussion

In this pilot study of CTP, we found patients, who had previous hospital and ED utilization, both being seen within 7 days, and the performance of a psychosocial screen to be univariate predictors of 30-day readmission. No other process measure or utilization pattern helped predict 30-day readmission. With the small number of outcomes and the pilot nature of the study, these findings were not unexpected. Statistically, previous utilization (hospital stays and ED visits) did predict a 30-day readmission. This finding is consistent with previous predictors of hospitalization like the Probability of Repeat Admission questionnaire (PRA) [5] as well as the ERA [3]. Being seen within 7 days had a higher risk of rehospitalization, which would not have been expected, but likely explained by patients seen within 7 days being more medically unstable. Lastly, the patients readmitted only had a 20% documented psychosocial evaluation, indicating the potential importance of this issue for readmission.

We also focused on the clinical outcomes and clinical benchmarks for this practice change. Nationally, there is a 19.6% readmission rate to the hospital [6]. We found an 11% readmission rate based on this small pilot study, which would be close to a 44% reduction in readmission, based upon national benchmarks. Previous studies have shown reductions in hospitalizations using CTPs. In an NP model, investigators found a 36% reduction in hospitalizations in 52 weeks of follow-up [7]. Using RN care coordinators with a standardized dismissal process, the investigators found a 48% reduction in 30-day readmission, compared to usual care [8]. These reductions are consistent with the same scale that was found in our pilot, compared to national averages. The clinical benchmarks of 90% were not achieved with any of the process measures. The process measures of medication reconciliation, functional assessment (activities of daily living and debility), and psychosocial evaluations had greater than 70% adherence and revealed encouraging clinical processes. Depression, understanding the clinical illness, and follow-up tests were less well performed or documented.

There are numerous limitations to this pilot and this should be taken as hypothesis generating. The small number of charts that fulfilled criteria resulted in only 45 charts with a completed CTP with a qualifying hospital stay. We did not have a comparator group for evaluating the significance of the readmission rates. The small number of outcomes (5 readmissions) reduced the power to detect a difference. The biggest limitation involves the documentation of process variables. It is very possible that the NP clinical staff did not document all discussions or assessments. This limitation decreased the ability to determine the utility of these process measures for readmission. Standard documentation of process measures may allow better clinical and research analysis of these measures for the future and also allow real-time quality improvement.

Conclusion

This pilot study of care transitions within this integrated primary care group practice showed promising results of 11%, 30-day readmission rate, compared to a national rate of 19.6%. Psychosocial screening and timely evaluations helped predict 30-day readmission. Many process measures showed good adherence from the clinical staff including the important medication reconciliation. It will be important to have follow-up studies, which are larger and integrate standard documentation to help determine the key factors of CTP involved in predicting important patient centered outcomes, such as hospital re-admissions and ED visits.

Acknowledgments

Conflicts of Interest

The authors have no financial or other conflicts of interest to disclose.

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