

# The Social Determinants of Health Experts.

Impact of a Combined Coleman Care Transitions Interventions<sup>®</sup> and Bridge Model Intervention on Readmissions and Medicare Spending

# TITLE and ABSTRACT

### 1. Title

# Impact of a Combined Coleman Care Transitions Interventions<sup>®</sup> and Bridge Model Intervention on Readmissions and Medicare Spending

# 2. Abstract

#### **Background**

This study evaluated the Partners in Care Foundation's (Partners) care transitions program, one of over 100 projects that were approved by the Centers for Medicare & Medicaid Services (CMS) for participation in its Community-based Care Transitions Program (CCTP), which was designed to reduce readmissions and other preventable patient outcomes among Medicare recipients.

#### Local Problem

The Partners, a local response to the national challenge addressed by the CCTP, united an existing communitybased organization (CBO) operating in three regions in California with 11 hospitals and multiple other CBOs, improving care coordination after discharge for Medicare fee-for-service (FFS) beneficiaries.

#### **Methods**

This retrospective study examined the long-term impact of participation in the Partners program on a sample of its participants, comparing data for 5,075 Medicare FFS beneficiaries for one year after discharge (intervention group) to results of 5,075 propensity-score matched beneficiaries who received usual care from the same institutions (comparison group). The study population was composed of patients admitted to one of the participating hospitals between January 1, 2014, and December 31, 2016. Participants were followed for one year after the index discharge.

# **Interventions**

The Partners program combined the Care Transitions Intervention (CTI) Model with the Bridge Patient-Activation Model developed by Rush University in a hybrid social/work-based intervention that could be provided through home visits or telephonically. The focus was on using trained, nonclinical transition coaches to work with patients and their caregivers on improving patient engagement and empowerment after returning home from the hospital.

The intervention group had significantly lower mortality rates than the comparison group for the entire year after discharge. The intervention group's all-cause readmission rates were significantly lower up to 60 days after discharge. In addition, the intervention group's average Medicare spending per beneficiary (MSPB) was significantly lower up to 90 days after discharge.

#### **Conclusions**

This social/work-centered, hybrid home and telephonic, patient-centered approach to coaching chronically ill older patients and their caregivers was associated with significant improvements in patient health outcomes (e.g., readmissions and mortality) and reduction in costs after discharge.

# **INTRODUCTION**

# 3. Problem Description

CMS launched the CCTP in 2012 to harness evidence-based best practices to reduce the high proportion of Medicare patients—nearly one in five—who were readmitted within 30 days after discharge from the hospital. The CCTP was predicated on the belief that many of these readmissions, as well as other suboptimal health outcomes, could be prevented with improved transitional care planning. Partners is a CBO that serves a predominantly low-income, ethnically diverse population of Medicare beneficiaries located in three regions in the Los Angeles area—Westside Los Angeles, Kern County, and Glendale. For this program, the CBO joined with hospitals, local nonprofits, and human services agencies to transform care. The hospital partners are shown in **Table 1**.

Westside	Kern County	Glendale				
Santa Monica UCLA Medical Center	Bakersfield Memorial Hospital	Dignity Health Glendale Memorial Hospital				
Ronald Reagan UCLA Medical	Mercy Hospital	USC Verdugo Hills Hospital				
Center						
Providence Saint John's Health	Kern Medical Center	Glendale Adventist Medical				
Center		Center				
	San Joaquin Community					
	Hospital					
	Bakersfield Heart Hospital					
Source: Final Evaluation Report, Evaluation of the Community-based Care Transitions Program. Centers for						
Medicare & Medicaid Services. Baltimore MD; 2017: Contract No. HHSM-500-2011-00015I.						

#### Table 1—Hospitals Participating in the Partners Project by Region

Quarterly reports prepared for the three regional sites provided 2010 baseline 30-day readmission and mortality rates, as shown in **Table 2**. The baseline readmissions rates were calculated for each of the three regions by averaging 30-day all-cause hospital readmissions among participating hospitals, which ranged from 20.2 percent to 21.9 percent. Thirty-day mortality rates ranged from 4.0 percent to 4.5 percent. **Table 2** also presents the baselines for all 100 projects participating in the CCTP.

#### Table 2—Outcome Measures at Baseline by Region

Measure	Westside	Kern County	Glendale	All CCTP Participants		
30-day All-Cause Readmission Rate	20.2%	21.9%	20.2%	20.8%		
30-day Mortality Rate	4.0%	4.5%	4.2%	4.5%		
Source: Econometrica, Inc. Final Evaluation Report, Evaluation of the Community-based Care Transitions Program. Centers for Medicare & Medicaid Services, Baltimore MD: 2017; Contract No. HHSM-500-2011-000151						

# 4. Available Knowledge

The need for coordination between different healthcare providers across transitions in care is well known, and CCTP was designed to focus on the population known to benefit most from transitional care coordination (i.e., Medicare beneficiaries at heightened risk of avoidable hospital readmissions.) Risk factors identified in the literature that place individuals at higher risk for readmission include multiple hospitalizations, multiple chronic conditions, and polypharmacy. A host of psychosocial issues are also implicated in increased risks of readmission, including living alone, lack of self-management skills, and limited education, as well as inadequate or inappropriate care, patients' difficulty with adherence to medication and self-care regimens, lack of needed social support, and lack of clear communication between patients and providers and among providers (Arbaje et al., 2008, Brock et al., 2013, Brown, Peikes, Peterson, Schore, & Razafindrakoto, 2012).

A variety of strategies for improving care transitions have been used in programs that reduced readmissions, and home nurse visits are a common feature of most successful strategies. Home visits by nurses have been associated with improving patient outcomes including mortality and readmissions up to six months after hospitalization (Van Spall et al., 2017, Buurman et al., 2016). The most effective programs also use multiple components and focus on providing support for patients' capacity for self-care (Leppin et al., 2014, Brown et al., 2012). The Bridge Patient-Activation Model (Bridge Model), a social work model combining care coordination, case management, and patient engagement, has been recommended as a less costly but effective alternative to a clinical care model.

# 5. Rationale

The Partners developed its program, combining the CTI Model with the Bridge Model, and systematized home medication reconciliation. The Bridge Model's telephone-based social work model enabled Partners to reach patients who were reluctant to allow strangers into their homes, or who lived outside the geographic boundaries of the service delivery areas. Partners approach was not clinically focused, but relied on social workers, gerontologists, and community health workers trained as coaches to work with patients to increase patient engagement and empowerment.

# 6. Specific Aims

The overall aim of the Partners project was to implement a patient-centered transition coaching model that would improve patient outcomes and reduce costs. The immediate goal was to assess whether the Partners intervention impacted participants' readmission rates, mortality rates, and average MSPB in the 30 days after discharge. This report builds on those results by examining data for an entire year after discharge.

# **METHODS**

# 7. Context

The three regions served by Partners encompassed a variety of different communities and populations, healthcare infrastructures, and security issues.

The Glendale region served a predominantly Armenian urban population and included a partnership between three hospitals. The site used a hospital-field worker model, dividing responsibilities between staff located in and working closely with hospital discharge planners to identify and contact candidates for the program, and those in the field who focused on building relationships with patients after they returned home. The Partners field staff was given limited access to the hospitals' electronic health record (EHR) beginning in 2015, when two hospitals adopted systems.

The Westside partnership, also composed of three hospitals, included seven additional community partners which, together, served a multicultural urban population. Coaches were bi- or trilingual and originated from the ethnic

communities they served. In this region, there was no EHR access outside the hospitals due to what was perceived as a higher risk to patient medical information (i.e., theft of laptops or other devices carried by the workers in the field).

The Kern County region served both suburban and rural populations and partnered with five hospitals and three community partners. Partners staff members visiting patients in this region were permitted to carry laptop computers or devices and had access to the hospitals' EHRs and resources. The population of this region was more widely dispersed, more geographically isolated, and included a large proportion of migrant workers living in agricultural communities and requiring different support services.

# 8. Interventions

Partners combined hospital discharge data analysis with the findings of a root cause analysis, and with feedback from clinical leaders to create a profile to identify Medicare FFS inpatient beneficiaries (with Part A and Part B) at high risk for readmission prior to hospital discharge. The objective criteria are listed in **Figure 1**. Patients who met two or more objective criteria were identified by Partners transition coaches, who visited them in the hospital at least 24 hours prior to discharge.



	Two or more admissions in last 12 months
•	Two or more ED visits in last 6 months
•	Length of stay greater than 10 days
•	Eight or more medications and/or
	outpatient adjustment of 2 or more
	medications at discharge
•	Limited caregiver support at home
•	Two or more chronic conditions
•	Functional impairment
•	Depression as a Secondary Diagnosis
•	Mild cognitive impairment, especially
	with inadequate caregiver support

Prospective subjects were offered the Partners program by bridge care coordinators. Those who consented were visited in their homes or contacted by telephone within 24–72 hours post-discharge and received three follow-through support telephone calls within 30 days. The Partners program adopted the four pillars of the CTI as shown in **Figure 2** (Parry, Coleman, Smith, Frank, & Kramer, 2003).

#### Figure 2—Elements of CTI Approach



The intervention was designed to develop patient and family skills for self-care and self-monitoring of changes in condition, medication management, and for connecting with resources needed to safely recuperate at home. The Partners program emphasized the need to assess and provide for a variety of social determinants of health known to impact patients' risk for readmission or other poor health outcomes after discharge from the hospital. An assessment identified patients' situations with regard to social determinants of health including their understanding of discharge instructions, caregiver needs, transportation issues, access to medications, and connection to home and community-based services if necessary as shown in **Figure 3**.

#### Figure 3—Social Determinants of Health



An in-home assessment evaluated patient understanding of medications and adherence issues; incidents that might indicate an increased risk of adverse drug events such as falls, dizziness or confusion; nutrition (including the ability to shop for food and cook); transportation to care; the presence of particular fall risks in the home; and behavioral health issues such as diet, physical activity, and alcohol and tobacco use. Patient materials were developed in English, Armenian, Spanish, and Farsi.

Partners found that a significant segment of the candidates eligible for its services were not comfortable with home visits, whether for cultural or personal reasons. By adding the Bridge Model to its scope of services, Partners was able to greatly increase the number of patients it was able to engage after discharge. In fact, half of Partners participants and the majority in its Kern and Glendale regions used the Bridge Model.

The Bridge Model supplemented the pillars of the CTI program by employing social workers to provide its elements and to aid patients and families in obtaining community services via phone. It also provided an information sheet on preparing for discharge before the patient left the hospital, and telephone follow-up within 48 hours of discharge and additionally as needed through 30 days post-discharge.

# 9. Measures

Partners monitored the following process measures to evaluate progress of the project:

Home visits: The percentage of participants who received a home visit within 48 hours of discharge.

Bridge phone calls: The percentage of participants who received an initial Bridge call within 48 hours of discharge.

Thirty-day calls: The percentage of participants who received a final phone call 30 days after discharge.

The following outcome measures were chosen to evaluate the intervention:

<u>Readmissions</u>: The percentage of readmissions within 30, 60, 90, 180, and 365 days after the index discharge. <u>Mortality</u>: The percentage of members who died within 30, 60, 90, 180, and 365 days after the index discharge. <u>Medicare Spending Per Beneficiary</u>: The average Medicare spending per beneficiary from the date of the index discharge through 30, 60, 90, 180, and 365 days post-discharge.

# 10. Analysis

The study population included Medicare FFS beneficiaries who met the eligibility criteria and who were admitted to any of the participating hospitals between January 1, 2014, and December 31, 2016. A total of 31,301 beneficiaries consented to participate in the program. A sample of this population numbering 5,075 (the intervention group) was identified in Medicare claims data and matched with hospital admissions. All participants in the program were followed for 30 days post-discharge by the Partners team, which performed the interventions and documented their care. Analysis considered one year of follow-up claims data from the date of

discharge. Examination of claims data from the participating hospitals identified 23,990 beneficiaries discharged from the partner hospitals who had not received the intervention. Propensity scores were used to match the intervention group to a comparison group of 5,075 individuals based on a set of covariates that included discharge setting, demographic, and disease characteristics, and were limited to Medicare FFS beneficiaries discharged from one of the participating hospitals during the same time frame who did not participate in the program. The disease conditions considered were Alzheimer's, asthma, arthritis, atrial fibrillation, breast cancer, colorectal cancer, lung cancer, prostate cancer, chronic kidney disease, chronic obstructive pulmonary disease (COPD), depression, diabetes, heart failure, hepatitis (chronic viral B and C), hyperlipidemia, hypertension, ischemic heart disease, osteoporosis, schizophrenia, and stroke. Statistical tests were performed to evaluate differences between the two groups for age, race/ethnicity, gender, and discharge setting, as reflected in **Table 3**. Differences in the percentage of each population with the chronic disease conditions of interest are presented in **Table 4** 

	Comparison Group		Interventio	Intervention Group		
Demographic	Number (5,075)	Percentage	Number (5,075)	Percentage	<i>p</i> -value	
Age						
Equal to or less than 64	892	6.46%	899	17.71%	0.8554	
65-70	970	19.11%	986	19.43%	0.6872	
71-75	815	5.90%	815	16.06%	1.0000	
76-80	799	5.78%	799	15.74%	1.0000	
81-85	680	4.92%	720	14.19%	0.2496	
Equal to or greater than 86	919	6.65%	856	16.87%	0.0997	
Race/Ethnicity						
Unknown/Other	230	4.53%	242	4.77%	0.5716	
White	3,884	76.53%	3,787	74.62%	0.0250*	
Black	324	6.38%	299	5.89%	0.3012	
Asian/Pacific Islander	255	5.02%	311	6.13%	0.0154*	
Hispanic	361	7.11%	416	8.20%	0.0400*	
North American Native	21	0.41%	20	0.39%	0.8756	
Gender						
Male	2,419	47.67%	2,404	47.37%	0.7656	
Female	2,656	52.33%	2,671	52.63%	0.7656	
Discharge Setting						
Home	3,092	60.93%	3,066	60.41%	0.5973	
Skilled Nursing Facility	337	6.64%	329	6.48%	0.7484	
Home Health Agency	1,364	26.88%	1,408	27.74%	0.3270	
Hospice	17	0.33%	20	0.39%	0.6212	
Other	265	5.22%	252	4.97%	0.5573	

# Table 3—Population Characteristics After Propensity Score Matching

\*Statistically significant differences between comparison group and intervention group based on Chi-square test.

	Compariso	n Group	Interventio	on Group		
 Chronic Condition	Number 5,075	Percentage	Number 5,075	Percentage	<i>p</i> -value	
 Alzheimer's Disease	652	12.85%	667	13.14%	0.6579	
Asthma	970	19.11%	952	18.76%	0.6484	
Arthritis	2,757	54.33%	2,690	53.00%	0.1823	
Atrial Fibrillation	1,298	25.58%	1,280	25.22%	0.6815	
Breast Cancer	215	4.24%	243	4.79%	0.1806	
Colorectal Cancer	262	5.16%	218	4.30%	0.0396*	
Lung Cancer	124	2.44%	152	3.00%	0.0875	
Prostate Cancer	163	3.21%	159	3.13%	0.8208	
Chronic Kidney Disease	2,516	49.58%	2,504	49.34%	0.8117	
COPD	1,862	36.69%	1,868	36.81%	0.9017	
Depression	1,390	27.39%	1,424	28.06%	0.4509	
Diabetes	2,357	46.44%	2,484	48.95%	0.0116*	
Heart Failure	2,062	40.63%	2,048	40.35%	0.7771	
Hepatitis (Chronic Viral B & C)	171	3.37%	160	3.15%	0.5387	
Hyperlipidemia	3,805	74.98%	3,771	74.31%	0.4379	
Hypertension	4,443	87.55%	4,468	88.04%	0.4484	
Ischemic Heart Disease	2,838	55.92%	2,787	54.92%	0.3085	
Osteoporosis	948	18.68%	882	17.38%	0.0884	
Schizophrenia	285	5.62%	302	5.95%	0.4698	
Stroke	943	18.58%	957	18.86%	0.7217	

#### Table 4—Disease Conditions After Propensity Score Matching

\*Statistically significant differences between comparison group and intervention group based on Chi-square test.

#### a. Qualitative and quantitative methods used to draw inferences from the data

The process measures were evaluated using the entire population of 31,301 individuals who received the intervention. Partners data documenting the number of individuals who received contact by telephone or a home visit within 48 hours after discharge, as well as the number who received a final call 30 days after discharge, were used to calculate the percentage of program participants who received each process.

The approach used to assess the impact of the intervention was a comparison of the outcome measure rates between discharged beneficiaries who received the intervention and a matched comparison group who received usual care. For each beneficiary in each of the groups, readmissions, deaths, and Medicare spending that occurred during the 365 days after the index discharge were calculated.

#### b. Methods for understanding variation within the data, including the effects of time as variable

Differences in the demographic characteristics of the intervention and comparison groups were analyzed utilizing a Chi-square test. The intervention outcomes were assessed by comparing comparison-group data to intervention-group data. To examine the effects of time as a variable, Chi-square tests were used to compare the differences in readmission rates between the intervention and comparison groups at five end points over the course of an entire year post-discharge. The difference between the average MSPB for the two groups was compared using a *t* test.

# **11. Ethical Considerations**

Consent was obtained from patients who agreed to participate in the Partners program. Only aggregated data and non-identifiable health information were analyzed and disclosed in this report.

This project was funded through CMS' CCTP with an average fee of \$418.00 per patient who participated in the program.

# RESULTS

#### 12. Results

#### a. Observed associations between outcomes, interventions, and relevant contextual elements

1. Participation in the Partners was associated with significantly lower mortality rates throughout the year postdischarge.

Deaths among the study population were identified and a Chi-square test was used to compare the mortality rates of the intervention and comparison groups at 30, 60, 90, 180, and 365 days post-discharge. The results are displayed in **Table 5** and demonstrate significantly lower mortality among patients who received the Partners intervention throughout the year after discharge.

Time Post- Discharge	Comparison N = 5,075	Percentage	Intervention N = 5,075	Percentage	<i>p</i> value	
30 days	187	3.7%	86	1.7%	< 0.0001*	
60 days	327	6.4%	187	3.7%	< 0.0001*	
90 days	422	8.3%	269	5.3%	< 0.0001*	
180 days	596	11.7%	483	9.5%	0.0003*	
365 days	902	17.8%	808	15.9%	0.0127*	
*Statistically significant differences between comparison group and intervention group based on Chi-square test.						

 Table 5—Mortality Rates Post-Discharge

2. Participation in the Partners intervention was associated with significant reductions in readmission rates up to 60 days post-discharge.

Medicare claims data were used to identify all inpatient readmissions to any hospital in the year after discharge for the intervention and comparison groups. A Chi-square test was used to compare the readmission rates at 30, 60, 90, 180, and 365 days post-discharge. The results are displayed in **Table 6** and demonstrate significant reductions for readmissions among patients who received the intervention 30 and 60 days post-discharge.

Time Post- Discharge	Comparison N = 5,075	Percentage	Intervention N = 5,075	Percentage	p value
30 days	810	16.0%	660	13.0%	<0.0001*
60 days	1,151	22.7%	1,032	20.3%	0.0040*
90 days	1,360	26.8%	1,295	25.5%	0.1421
180 days	1,733	34.1%	1,747	34.4%	0.7697
365 days	2,257	44.5%	2,296	45.2%	0.4364
*Statistically significant differences between comparison group and intervention group based on Chi-square test.					

Table 6—Readmission Rates Post-Discharge

3. Participation in the Partners was associated with significantly lower average MSPB up to 90 days post-discharge.

The intervention group exhibited significantly lower average Medicare expenditures for the 90 days postdischarge than the comparison group. The differences in the Medicare expenditures between groups were compared using a t test at 30, 60, 90, 180, and 365 days post-discharge, yielding p-values as shown in **Table** 7.

Time Post- Discharge	Average MSPB Comparison	Average MSPB Intervention	<i>p</i> -value		
30 days	\$9,699	\$7,927	< 0.0001*		
60 days	\$14,648	\$12,452	< 0.0001*		
90 days	\$18,622	\$16,968	0.0110*		
180 days	\$28,269	\$27,295	0.3027		
365 days	\$44,326	\$45,715	0.3568		
*Statistically significant differences between comparison group and intervention group based on <i>t</i> test.					

Table 7—Average MSPB Post-Discharge

# b. Process measures

Roughly half of the more than 31,401 beneficiaries who participated in the Partners program received a home visit within 48 hours of discharge. The other half received a Bridge telephone call instead. Approximately 80 percent of the total population completed the entire 30-day intervention, as evidenced by a 30-day telephone call. The results are presented in **Table 8**. The data for these measures were collected in Partners program records, and no statistical analysis was performed. The results were not limited to the patients who were matched for the study of the outcome measures but are based on the entire population of 31,401 who received the intervention.

### Table 8—Performance and Timing of Major Intervention Elements

Process Measures	Individuals Receiving Intervention N = 31,401	Percentage
Home visit within 48 hours of discharge	15,327	48.8%
Bridge call within 48 hours of discharge	16,479	52.5%
Both home visit and Bridge call	405	1.3%
Follow-up telephone call 30 days after discharge	25,381	81.0%

# DISCUSSION

#### 13. Summary

#### a. Key findings

Medicare beneficiaries who received the Partners intervention exhibited significantly lower mortality rates throughout the year after discharge and experienced significant reductions in readmission rates up to 60 days post-discharge. Average MSPB was significantly lower than that of the comparison group at 30, 60, and 90 days post-discharge.

Beneficiaries were evenly split between those who consented to home visits and those who preferred a telephonebased intervention. That overall results showed improvement using two different interventions supports PCIF's success at designing a cost-effective telephonic approach used by social workers that achieved similar levels of improvement to those found in many studies involving only in-person visits by clinical staff.

Moreover, both the intervention and comparison populations were large and extremely diverse, supporting the robust nature of the intervention.

# 14. Interpretation

#### a. Nature of the association between the intervention and the outcomes

This study produced evidence of association between the Partners intervention and reductions in readmissions, mortality, and Medicare spending after discharge. The length of the effect varied for different measures and was most persistent for mortality, lasting throughout the year assessed. The results were consistent, statistically significant, and in the direction that would be expected if the intervention improved coordination of care after discharge. The large size of the study populations combined with the propensity score matching mitigated the risk of bias inherent in any non-randomized study. The results are plausible and in agreement with currently accepted scientific understanding of the processes that improve coordination of care transitions after discharge from the hospital and result in improved patient outcomes and cost savings. The evidence strongly suggests that the Partners improved readmissions and patient outcomes and resulted in significant cost savings for at least 60 days and as much as 365 days after discharge.

No less important is the achievement of this success with a workforce of non-clinically licensed transition coaches, whose contact was largely telephonic. These factors likely resulted in additional cost efficiencies without a sacrifice in quality of care.

# b. Comparison of results with findings from other publications

The results were consistent with the literature, which reports reductions in readmissions for similar interventions ranging from 8 percent to 50 percent, depending on the study and the population (Brown et al., 2012, Phatak et al., 2016, Polinski et al., 2016). Whether reported studies have demonstrated significant cost savings has been highly dependent on the risk profile of the population studied, the details of the intervention, and the length of time covered (Brown et al., 2012). The longer follow-up period of this study makes the results particularly important and addresses a gap in the pre-existing literature.

Forty-four of 101 CCTP sites (43.6 percent) qualified for a one-year extension of the project, and all three of the Partners sites were among those granted extensions. Extensions were awarded to CCTP sites that demonstrated the ability to meet recruitment goals and to have an early impact on readmissions and costs (Econometrica, 2018). Across its sites, the Partners project exhibited many of the qualities that were identified in the qualitative analysis of the Final Evaluation Report as commonly associated with successful programs. These factors included Partners adoption of the CTI Model, as well as its modification of the approach to meet the needs of the varying populations at its sites. Successful sites also tended to divide the responsibilities of hospital- and homebased coaches to promote integration with the hospitals with which they worked.

The results are also consistent with Avalere Health's report, "Effective Management of High-Risk Medicare Populations." In that report, the SCAN Foundation identified criteria for successful interventions in the Medicare Advantage population. It found that strategies should include nonmedical factors, rather than focusing solely on medical conditions. It suggested that health plans need to develop more risk assessment profiles using a variety of data beyond claims and diagnosis, using existing data and tools. The same types of improvements could reasonably be expected to produce similar improvements in the efficiency of care in the Medicare FFS population. The report recommended a more targeted care coordination approach, which would improve outcomes and yield positive financial returns (Rodriquez, Munevar, Delaney, Yang, & Tumlinson, 2018).

# c. Impact of the project on people and systems

The Partners intervention appears to have had an immediate, significant impact on the mortality rates among recipients. The reductions were consistent, long-term, and found throughout the year after discharge. There were also significant benefits in terms of lower readmissions and costs up to 60 and 90 days after discharge, respectively.

The project created a broad-based coalition of community entities including hospitals, CBOs, and other agencies dedicated to providing patient-centered care for vulnerable populations in a large portion of California.

# LIMITATIONS

This study had several limitations. First, the three regional populations were very different and may have had different levels of response to the intervention that were masked by calculating overall averages. In addition, there were regional differences in the degree to which field workers were able to access patients' EHR records, one of the key characteristics present in the more successful CCTP sites, as discussed in the Final Evaluation Report. Since variation in impacts arising from these differences in infrastructure may have been masked using overall averages, the extent of generalizability of the results is difficult to assess.

Another limitation was the lack of randomization; however, the impact of this limitation was minimized with the use of propensity-score matching. Although calculation of the outcome measures relied on claims data, which

may fail to detect adverse events found by medical chart review, the claims data should be fairly reliable for the limited purposes used here, specifically for identifying whether a patient was hospitalized or died, and the amounts practitioners billed for Medicare FFS.

# **CONCLUSIONS**

# a. Usefulness of the work

Both industry trends and CMS policy decisions indicate that improvements to coordination across transitions in care will continue to play a critical role in improving healthcare while controlling costs. This work should prove useful to communities, hospitals, and health systems that lack the time and resources to create an effective care transition program internally. This is particularly important given the nationwide shift to value-based purchasing which requires improvements in care coordination across the continuum of care and between settings and providers.

The results of this study underscore the importance of patient-centered, integrated, interprofessional models of care across transitions. The Partners intervention also provides a good prototype for an efficient, cost-effective division of the many tasks necessary to improve coordination of care among healthcare professionals with the appropriate expertise fitted to the task. Its demonstrated success with a non-clinically trained workforce and its reliance on telephone contact indicate that substantial cost efficiencies are possible and can coexist with significant improvements in patient outcomes.

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