

FINAL PROGRESS REPORT

Trial of the CarePartner Program for Improving the Quality of Transition Support

John Piette, PhD, Principal Investigator
Eve Kerr, MD, Co-Investigator
Steven Bernstein, MD, Co-Investigator
James Aikens, PhD, Co-Investigator
Brent Williams, MD, Co-Investigator – no longer
Caroline Blaum, MD, Co-Investigator – no longer
Christopher Kim, MD, Co-Investigator – no longer

Organization: Regents of the University of Michigan

Dates: 09/01/2011 through 06/30/2014, with no-cost extension through 06/30/2015

Federal Project Officer: Jon White

Grant Mgmt Specialist: Steven Young

Supported by AHRQ

Grant Number: R18 HS19625

John D. Piette, PhD^{1,2}, Dana Striplin, MHSA¹, Jenny Chen, MPH^{1,2}

1 HSR&D Center for Clinical Management Research, Ann Arbor VA Healthcare System, Ann Arbor, MI

2 University of Michigan School of Public Health, Department of Health Behavior and Health Education, Ann Arbor, MI

September 30, 2015

Abstract

Trial of the CarePartner Program for Improving the Quality of Transition Support R18-HS-019625-01-A1

Purpose: Consistent with AHRQ goals to improve transitions using accessible health IT, we evaluated a novel intervention designed to improve the effectiveness of transition support for common chronic conditions via three mechanisms of action: (a) direct tailored communication to patients via automated calls post discharge, (b) support for informal caregivers via structured feedback about the patient's status and advice about how they can help, and (c) support for proactive care management including a web-based disease management tool, automated alerts about potential problems, and the capacity for asynchronous communication with patients and their caregivers. Specifically, the trial looked at: 1) whether the CarePartner intervention improves patients' readmission risk and functional status; 2) the impact of the intervention on patients' self-care behaviors and the quality of the transition process; and 3) whether the intervention improves caregiver burden and stress levels.

Scope: Patients hospitalized with complex chronic conditions frequently experience preventable short-term readmissions due to inadequate transition support. Although structured discharge planning with telephone follow-up improves transition outcomes, these services often are unavailable, and proactive outreach is often inadequate once the patient returns home. Informal caregivers are invaluable for ensuring successful transitions, but many patients live alone, have an in-home caregiver who is struggling with competing demands, or live at a distance from adult children or other potential sources of support. New models are needed for transition support that include low-cost technologies and more structured assistance for patients' informal caregiving network, while providing patients' clinical teams with the information they need to avert health crises.

Methods: Adults with complex chronic conditions were identified upon admission to a university-based acute care general medical service and an affiliated health system as well as a VA Healthcare System. Patients were asked to identify a CarePartner (CP) living outside their household; CPs were spouses, adult children, and others in their social network willing to play an active role in their transition support. Patients were randomized to the intervention or usual care. Intervention patients received automated assessment and behavior change calls, and their CPs received structured feedback and advice following each assessment. Patients' clinical team had access to patients' assessment results via the web and received automated reports about urgent health problems. Patients completed surveys at baseline, 30- and 90- days post discharge; utilization data were obtained from hospital records. CPs and clinicians were interviewed to evaluate intervention effects on processes of self-care support, caregiver stress and communication, and the intervention's potential for broader implementation. The primary outcome was 30-day readmission rates; secondary outcomes included functional status, self-care behaviors, and mortality risk.

Results: Outcome data processing and analyses are ongoing and will be reported at a later time.

Key Words: Health IT, informal caregiving, transition support, chronic conditions

Background

Patients with complex chronic conditions such as heart failure (HF) and chronic obstructive pulmonary disease (COPD) experience the most frequent and costly hospitalizations of any patient group. Many of these patients have unsuccessful transitions back to the community post-discharge and experience preventable readmissions as a result. Numerous randomized trials have shown that care management and proactive, post-discharge follow-up can substantially improve patients' rehospitalization rates and mortality risk. Unfortunately, most health care systems lack the staff or information infrastructure to provide telephone care management effectively. New models of transition support such as the BOOST program articulate the characteristics of effective transition services and provide guidance as to the core processes that signal a transition has been successful. However, despite the proven efficacy of coordinated post-discharge monitoring and education, hospital-based care managers often cannot provide the frequent (e.g., weekly or even daily) self-care support calls that many patients need, and large numbers of patients are still "lost in transition". Home-based telemonitoring devices are a partial solution to the gaps in transition care, but trials show that increased patient monitoring without the capacity to respond to identified problems has little if any impact on outcomes.

Informal care provided by family members and friends is a low-cost and potentially effective adjunct to formal care management services, improving patients' regimen adherence, quality of life, and mortality risk. However, potential caregivers of patients discharged with complex conditions often lack: the tools and expertise they need to systematically monitor patients' health and self-care, the education necessary to understand patients' self-care needs, and the structured guidance to help them know when and how to respond effectively to issues that arise during a transition from hospital to the home setting. An increasing number of high-risk patients live alone, and spousal caregivers often feel overwhelmed by competing demands including their own chronic diseases. More than 90% of older adults in the US have adult children, but for half of those individuals, their children live at a distance and lack the tools they need to play an effective role in supporting the patient or others involved in their care. The challenge for the next generation of studies focusing on improved post-discharge transitions will be to identify services and information technologies that informal caregivers (including those living at a distance) can use to play a more effective role so that health systems can meet the needs of a growing population of complex patients while preventing caregiver strain.

Purpose

This study was part of an ongoing program of research to develop strategies to improve chronic illness care using patient-centered information technology. We have found that: patients with chronic illnesses will complete automated telephonic assessments consistently over extended periods of time, many patients are interested in accessing self-management education via these calls, and the information patients report during automated assessments can identify individuals at high risk for health and behavioral problems. Moreover, we have found in randomized trials that regular automated assessments with follow-up by a clinician can improve patients' self-care, increase their use of guideline-concordant outpatient services, decrease symptom burden, and improve physiologic indicators of patients' health status.

In this study, we built on evidence demonstrating the benefits of health information technology-facilitated care management by evaluating the effectiveness of an intervention that makes possible an innovative transition support process developed based on state-of-the-art transition support models. A unique advance in this intervention is the provision of transition support not only for patients but also for their informal caregivers or "CarePartners" (CP). CarePartners were family members or friends living either with the patient or outside of the patient's household and supporting the patient and their clinical team in optimizing the quality of transition care. After discharge, intervention patients received tailored monitoring and self-care education via automated telephone (IVR) assessment calls. CPs of intervention patients received regular, structured updates about the patient's status (via email and/or automated telephone alerts) after each automated assessment. CPs used a structured protocol to review with the patient key self-management practices and address barriers to self-care that could impede patients' medication adherence, understanding of changes in their health, and appropriate clinical follow-up. Intervention patients' clinical team had access to information via fax about urgent problems that arose during post-discharge follow-up. Training materials were designed to promote coordinated information sharing among all parties, enhancing problem-solving capacities, and avoiding conflicting roles. Pilot data from several studies suggested that this service may significantly lessen the stress many caregivers experience due to their inability to: understand their loved-one's condition, monitor their status, and effectively provide targeted assistance in concert with other caregivers and the clinical team.

Methods

Automated Calling System:

We developed an automated calling system to deliver daily, tri-weekly, and weekly assessment and behavior-change calls to patients for three months after discharge at times they said were convenient for them. The automated calls were received on either the patient's landline or cell phone – daily for the first two weeks, three times per week for the next two weeks, and weekly thereafter for 9 weeks. Patients were followed in the study for 90 days. Patients did not need a computer or any other specialized equipment to participate. The patient's informal caregiver (CarePartner) received de-identified email updates after the patient completed each automated call and the patient's clinic was notified automatically via a structured fax if the patient reported an urgent health issue. The regularly-scheduled patient calls included recorded information and questions that the patient answered using their telephone keypad. During the automated assessment, patients were asked about common post-discharge problem areas (i.e. red flag symptoms, medications, follow-up, and discharge instructions). The script (including the information flow protocols) for the automated calls was developed by experts in chronic disease and post-discharge patient management and included general health assessment questions (how are you feeling today, how are you feeling today compared with yesterday); "red flag" symptom questions (tailored for each patient, i.e., shortness of breath, fever, chest pain, diarrhea, vomiting, and/or high or low blood sugar); medication self-management questions (e.g., did the patient have their medications, were they taking them as prescribed, did they understand the medication regimen and any discharge medication changes, and were they having medication side effects); questions about the patients' follow-up appointment with their healthcare provider (e.g., did they have a follow-up appointment scheduled, and did they think they would be able to attend the appointment); and questions about their hospital discharge instructions (e.g., did they have discharge instructions that they were confident about understanding and following) (see Table 1 for automated call content overview). The computing infrastructure was housed with state-of-the-art data security protections. Each assessment used a tree-structured algorithm to tailor the calls according to what patients reported.

Human Subjects and Incentives:

All patients completed a written informed consent and received a \$20 gift card for completing each of the study surveys (at baseline, one month, and three months) for a total of \$60 in incentives. Informal caregivers (CPs) provided verbal consent according to the protocol

approved by the study site IRBs. The study received IRB approval from the Human Subjects Committees at the three study sites: the University of Michigan Healthcare System, the MidMichigan Healthcare System (an affiliate of the University of Michigan Healthcare System), and the VA Ann Arbor Healthcare System (see Table 2).

Recruitment and Intervention Process:

Eligible participants were being discharged home after a hospital stay at a participating study site and had a diagnosis indicating a high risk for readmission (such as congestive heart failure, chronic obstructive pulmonary disease, pneumonia, deep vein thrombosis, pulmonary embolism, and coronary artery disease) and a PCP associated with the participating study site. The following groups of patients were excluded: patients with limited life-expectancy, bipolar disorder, schizophrenia, active alcohol or drug problems, and those who were not able to respond to automated self-management support calls in English (see Table 3 for a list of inclusion/exclusion criteria).

A total of 1,989 potentially eligible patients were identified from electronic medical records. Of patients who were approached during their inpatient stay (N=715), 339 (47%) enrolled. Interested patients were consented by study staff before they were discharged from the hospital. Patients were asked to identify potential informal caregivers, or CarePartners, i.e., people with whom the patient felt comfortable sharing their health information, such as a relative or friend. Patients were asked a series of questions about each potential partner per the Norbeck Social Support Questionnaire (Norbeck 1983) to assist in identifying the most appropriate partner for the study. The CarePartner completed screening in person or via phone, provided their verbal consent to participate, and then received the baseline survey via email. After the patient completed their baseline survey, they were randomized to one of two groups: the Telemonitoring plus Self-Management Support Group or the Usual Care Group. After enrollment, participants who chose to receive additional materials were mailed materials that contained information about their diagnoses, symptoms, and how to stay as well as possible. Intervention participants received additional materials about how to interact with their CarePartner and guidelines about how to talk to each other during their follow-up calls based on the patients' automated assessment reports. Patients in the Telemonitoring group received automated self-management phone calls during which they reported on their health and self-care practices. CarePartners received email and/or phone feedback after every automated call their patient-partner completed. The feedback included information about what the patient

reported during their most recent assessment call along with suggestions for how the CarePartner could help their patient-partner with self-care. If the patient reported an urgent issue during the automated call (such as having a fever of 101°F or greater) a fax report was sent to the patient's clinic and the patient's CarePartner was alerted (see Table 6 for a list of fax alert issues).

Measures:

The automated calling script, as well as the patient and CarePartner surveys and materials were developed with primary care doctors, experts in chronic disease, health behavior change, and IVR programming. In baseline surveys, respondents reported their demographic characteristics such as age, gender, income, education, marital status, and employment status. Participants were surveyed at baseline and follow-up about their physical and mental health using the SF-12 (Short Form Health Survey); depressive symptoms using the PHQ-8 (Personal Health Questionnaire); social support using the Social Support for Illness Scale (UM Health and Retirement Study); relationship with their CarePartner; disease self-efficacy and distress using the Disease Self-Efficacy Scale and Illness Management Distress scale; beliefs about their medications using The Beliefs About Medicines Questionnaire; medication adherence using the Morisky Medication Adherence Scale; use of health services as measured by the Health Service Access and Use instrument (Blyth 2004); and health literacy using a validated Health Literacy Screener (Chew 2004).

Patients reported satisfaction with the program in the 90-day follow-up survey, which included questions about their ability to use the automated calling system, how it impacted their communication with clinical and informal caregivers, and how it helped them manage their disease symptoms. In addition, the automated calling system tracked all patient calling attempts (incomplete calls, patient hang-ups before call completion, and completed calls), from which overall call completion rates were calculated (see Table 5). They were also asked about their transition from the hospital to home using the Care Transitions Measure.

Findings

Recruitment and Baseline Characteristics:

A total of 339 patients were enrolled. Participants' average age was 60 years, 40% were male, 69% had some college education, and 25% had an annual income less than \$15,000 (Table

4a). Table 4b shows that the CarePartners were younger than patients (average age, 50 years), more CarePartners were females (78% were female), CarePartners were more educated than patients (83% had some college education), and the average income for CarePartners was higher compared to patients (only 14% had annual income less than \$15,000). There were no significant differences in baseline sociodemographic or clinical characteristics of intervention versus control patients (Table 4a). Table 4b shows that there were no differences in baseline characteristics of the CarePartners of intervention vs control patients. A total of 57% of enrolled patients (N=194) have completed follow-up to date.

Automated Assessment Completion Rates to Date:

Participant call completion rates were calculated based on the total number of calls during which an assessment was scheduled divided by the total number of calls that were completed. Table 5 in this report shows that, overall, patients have completed 72% of scheduled automated assessments. In a recent publication in *Medical Care*, we reported IVR program engagement for CHF patients in a VA randomized controlled trial (RCT), as well as for patients with depression, diabetes, and cancer. Across all diagnostic groups, patients were followed for a total of 28,962 person-weeks. Patients with heart failure (followed for more than 15,500 call-weeks) and cancer had higher call completion rates (~90% in each group) than patients with diabetes (81% call completion rate) or depression (71% call completion rate; $p < .0001$).

Fax Alerts to the Clinical Team Based on Patients' Automated Assessments to Date:

For patients in the Telemonitoring group, fax alerts were sent to the clinical team in the event that the patient's responses to questions on their automated call indicated an urgent health issue. Table 6 shows the number and types of urgent fax alerts sent to participating clinics to date. All issues identified during a patient's automated call were sent in one compiled report to the clinical team.

As shown in Table 6, a total of 508 faxes (containing 683 issues) were sent to the clinics out of the 2,813 completed assessment calls. Most patients receiving the automated calls (123 of 176) generated at least one fax, while 53 generated no urgent alert faxes. Of the 508 faxes sent, 32% (or 164) were triggered by just 14 patients, each of whom triggered 10 or more urgent alerts.

Outcome Analysis:

Future analyses will include: changes in participant responses to their automated calls between baseline and follow-up (such as the number of times participants reported self-care issues) as well as participant satisfaction with the service, and baseline survey responses compared to follow-up survey responses. Given the abbreviated timeline for the project, outcome data processing and analyses are ongoing and will be conducted using discretionary funds available to Dr. Piette and the Co-Investigators and reported in 2016.

Status

Study participants are in the process of completing their 3 months of automated assessment phone calls and follow-up surveys. Outcome analyses are ongoing.

Impact

We found that it is technically feasible to deliver automated telephone monitoring and self-management support calls to patients transitioning from hospital to home in a major university healthcare system, a university affiliated healthcare network, and a VA healthcare system. We found that patients completed a high percentage (72%) of their telephone assessments and that structured automated calls are a feasible way to increase informal support for patients' self-care management and may serve as an effective enhancement to scarce clinical resources.

Planned follow-up projects by our team will seek to improve on the automated calling system by incorporating "adaptive dialogue design" techniques that allow the system to automatically adapt call content to patients' unique preferences, changing needs, and communication styles. A recently completed randomized trial of the CarePartner intervention for patients with high blood pressure showed that the intervention can significantly improve hypertension management among Spanish-speakers, resulting in better systolic blood pressures, fewer medication problems, better perceived health status, and fewer depressive symptoms (Piette 2012). Results from over 1000 patients enrolled in the automated calling system show that 81-90% completed their weekly calls even over a 12-month period (Piette 2013). In a randomized trial of Veterans from the Cleveland VA Healthcare System, heart failure patients received 12 months of weekly health monitoring and self-care education via IVR calls plus feedback to their clinician. CarePartners of the patients randomized to the mHealth+CarePartner (CP) received structured emails about how to support the patient's self-management. A greater proportion of

mHealth+CP patients reported taking their heart failure medications exactly as prescribed at both 6 months (8.8% more; $p=.024$) and 12 months (14% more; $p=.007$); mHealth+CP patients reported better patient-CP communication than standard mHealth patients and were less likely to report shortness of breath or clinically significant weight changes (all $p<.05$); analysis of the caregiving burden indicated that feedback to heart failure caregivers decreases stress and depressive symptoms; among CPs with higher baseline caregiving stress, those randomized to mHealth+CP reported lower levels than those in the standard mHealth arm at both six and twelve months ($p=.33$ and $.005$ respectively); and CPs in the mHealth+CP arm also reported more frequent attendance at patients' medical visits at six months ($p=.046$), and greater involvement in medication adherence at both endpoints (both $p<.05$).

Additional Information

This study has produced an incredibly rich although complex dataset, and additional analyses are ongoing. For those analyses, we are linking the two waves of CarePartner surveys to patient surveys so as to understand how the intervention affected caregivers' understanding of patients' health and self-care, and what impact those changes in caregiver engagement had on patients' self-care, functioning, and use of medical services. Moreover, these dyadic longitudinal surveys hold a wealth of information about caregiving relationships and the determinants of their success over time

Table 1: Automated call content overview

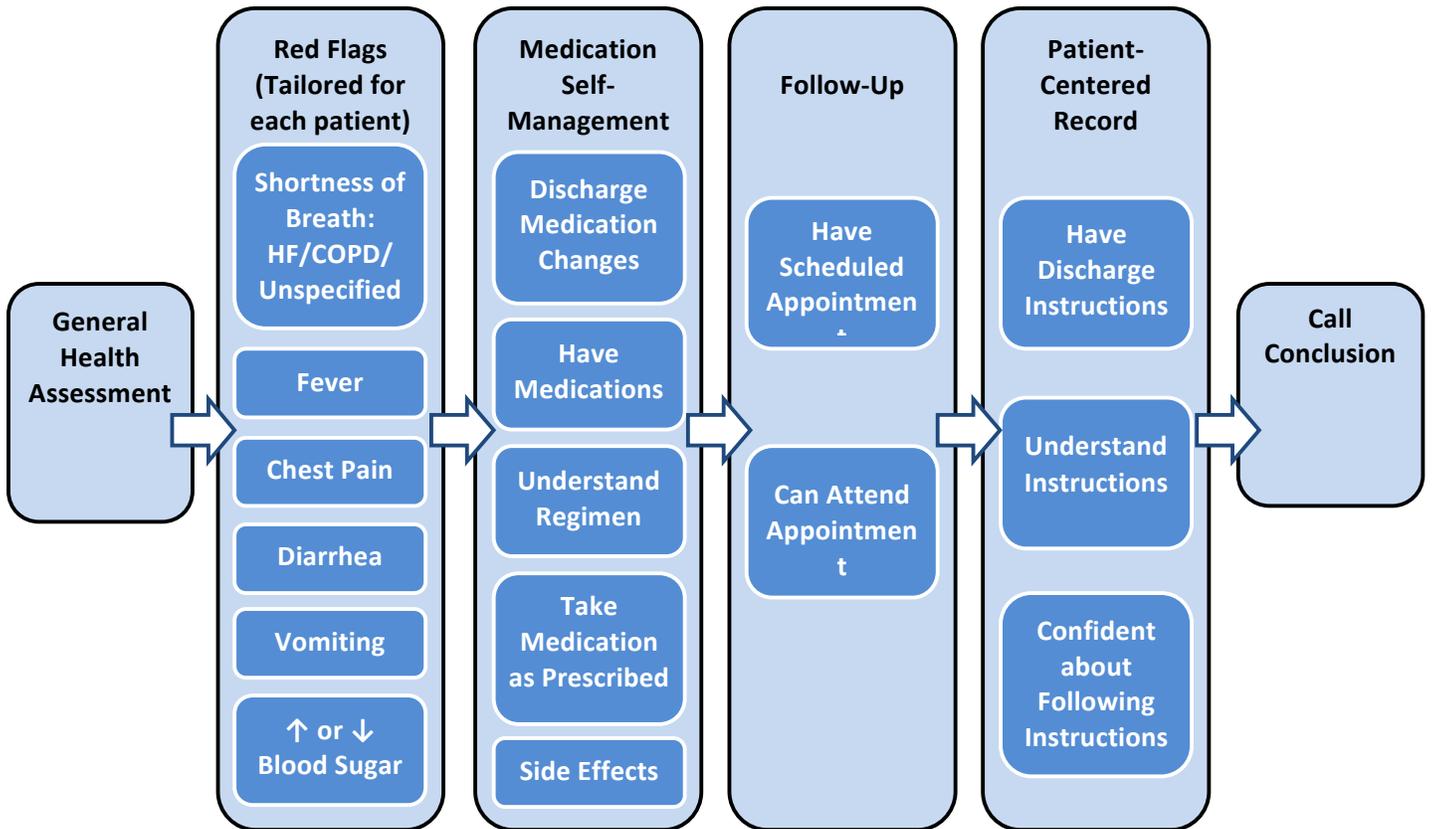


Table 2: Enrollment Sites

Enrollment Sites
University of Michigan Healthcare System
MidMichigan Healthcare System
Ann Arbor VA Healthcare System

Table 3: Inclusion/Exclusion Criteria

Inclusion Criteria:	
Discharged home after a hospital stay at a participating study site	
Had a PCP associated with the participating study site	
Any diagnosis putting patients at higher risk for readmission	
<ul style="list-style-type: none"> • Congestive Heart Failure • Stroke • Coronary Artery Disease • Arrhythmia • Chronic Obstructive Pulmonary Disease • Peripheral Vascular Disease • Deep Vein Thrombosis 	<ul style="list-style-type: none"> • Pulmonary Embolism • Pneumonia • Type 2 Diabetes • Urinary Tract Infection • Gastroenteritis • C. difficile Infection • Other Infections • Asthma
Exclusion Criteria:	
End stage renal disease, lung cancer, dementia, bipolar disorder, schizophrenia	
Active drug or alcohol problems	
Unable to answer automated telephone calls in English	

Table 4a. Characteristics of the Sample

	Overall N = 339	Control n = 163	Intervention n = 176	p = between groups diff
Age (mean ± SD)	59.6 ± 14.0	59.6 ± 14.2	59.5 ± 14.0	0.96
Gender (%)				0.09
Male	134 (39.5)	72 (44.2)	62 (35.2)	
Female	205 (60.5)	91 (55.8)	114 (64.8)	
Race (%)				0.11
White	245 (73.8)	120 (75.5)	125 (72.3)	
Black	57 (17.2)	30 (18.9)	27 (15.6)	
Other	30 (9.0)	9 (5.7)	21 (12.1)	
Married/Partnered (%)	184 (54.4)	87 (53.7)	97 (55.1)	0.80
Education (%)				0.28
High School or less	106 (31.5)	46 (28.6)	60 (34.1)	
Some college	231 (68.6)	115 (71.4)	116 (65.9)	
Employment Status (%)				0.76
Not employed	233 (68.9)	113 (69.8)	120 (68.2)	
Employed	105 (31.1)	49 (30.3)	56 (31.8)	
Annual Household Income (%)				0.21
< \$15,000	76 (25.3)	32 (22.1)	44 (28.4)	
≥ \$15,000	224 (74.7)	113 (77.9)	111 (71.6)	
VRSF-12 (mean ± SD)				
Physical Composite Score	29.0 ± 10.7	28.9 ± 10.8	29.0 ± 10.7	0.93
Mental Composite Score	46.0 ± 12.1	46.1 ± 12.3	45.9 ± 12.0	0.89
PHQ-8 (mean ± SD)	8.9 ± 5.6	8.5 ± 5.3	9.2 ± 5.9	0.25
How long to get to the clinic (%)				0.91
≤ 15 min	89 (26.3)	43 (26.5)	46 (26.1)	
15 - 30 min	119 (35.2)	54 (33.3)	65 (36.9)	
30 min - 1 hour	104 (30.8)	52 (32.1)	52 (29.6)	
≥ 1 hour	26 (7.7)	13 (8.0)	13 (7.4)	
Saw Doctor in Last Year (%)				0.51
≤ 5 times	149 (44.1)	71 (43.8)	78 (44.3)	
6-10 times	87 (25.7)	38 (23.5)	49 (27.8)	
11-20 times	49 (14.5)	28 (17.3)	21 (11.9)	
> 20 times	53 (15.7)	25 (15.4)	28 (15.9)	

Gone to ER in Last Year (%)				0.85
None	75 (22.2)	34 (21.0)	41 (23.3)	
Once	95 (28.1)	46 (28.4)	49 (27.8)	
2 - 5 times	135 (39.9)	64 (39.5)	71 (40.3)	
6 or more times	33 (9.8)	18 (11.1)	15 (8.5)	
Night in Hospital in Last Year (%)				0.46
None	107 (31.7)	45 (27.8)	62 (35.2)	
Once	103 (30.5)	51 (31.5)	52 (29.6)	
2 - 5 times	107 (31.7)	54 (33.3)	53 (30.1)	
6 or more times	21 (6.2)	12 (7.4)	9 (5.1)	
Missed Doctor visit in Last Year (%)				0.33
None	184 (54.6)	94 (58.4)	90 (51.1)	
Once	56 (16.6)	21 (13.0)	35 (19.9)	
2 - 5 times	86 (25.5)	40 (24.8)	46 (26.1)	
6 or more times	11 (3.3)	6 (3.7)	5 (2.8)	
Number of Medical Conditions (%)	5.8 ± 3.1	6.1 ± 3.2	5.5 ± 3.0	0.09

Table 4b. CarePartner Baseline Characteristics

	Overall N = 239	Control n = 124	Intervention n = 115	p = between groups diff
Age (mean ± SD)	49.8 ± 14.7	50.6 ± 14.5	48.9 ± 15.0	0.37
Gender (%)				0.21
Male	52 (21.8)	23 (18.6)	29 (25.2)	
Female	187 (78.2)	101 (81.5)	86 (74.8)	
Race (%)				0.49
White	184 (81.1)	99 (82.5)	85 (79.4)	
Black	34 (15.0)	18 (15.0)	16 (15.0)	
Other	9 (4.0)	3 (2.5)	6 (5.6)	
Married/Partnered (%)	143 (61.1)	70 (56.9)	73 (65.8)	0.17
Education (%)				0.16
High School or less	40 (17.1)	17 (13.8)	23 (20.7)	
Some college	194 (82.9)	106 (86.2)	88 (79.3)	
Employment Status (%)				0.48
Not employed	91 (39.1)	45 (36.9)	46 (41.4)	
Employed	142 (60.9)	77 (63.1)	65 (58.6)	
Annual Household Income (%)				0.25
< \$15,000	32 (14.2)	20 (16.7)	12 (11.3)	
≥ \$15,000	194 (85.8)	100 (83.3)	94 (88.7)	
PHQ-8 (mean ± SD)	3.3 ± 4.0	3.7 ± 4.2	2.8 ± 3.7	0.09
Relationship to Patient (%)				
Friend	59 (25.0)	32 (26.2)	27 (23.7)	
Child	78 (33.1)	36 (29.5)	42 (36.8)	
Sibling	44 (18.6)	23 (18.9)	21 (18.4)	
Parent	20 (8.5)	12 (9.8)	8 (7.0)	
Spouse/Partner	17 (7.2)	5 (4.1)	12 (10.5)	
Other	18 (7.6)	14 (11.5)	4 (3.5)	

Table 5. Call Completion Rates

Call Completion	
N (patients)	172
N (calls)	3,893
Median Follow-up (Q-Q)*	28 (18.5-29)
No. completed assessments	2,813
Assessments completed (%)	72.3

*Q-Q indicates interquartile range.

Table 6: Fax Notifications

Issues included in the Fax Notifications Sent to Clinics (over the 3-month enrollment period)	# of times the item was reported	# of unique patients that reported the item*
Heart Failure – Shortness of Breath (SOB)		
SOB is worse than yesterday for 3 consecutive calls	0	0
Weight gain of 3 pounds or more in a day	0	0
Weight gain of 5 pounds in the previous week	0	0
More swelling in legs, feet, ankles, or abdomen compared to yesterday	0	0
COPD – Shortness of Breath (SOB)		
Trouble breathing is worse than yesterday for 3 consecutive calls	0	0
Increasing or frequent trouble breathing while at rest or while trying to sleep	63	19
Coughing more frequently or change in sputum volume or color	39	19
Using rescue inhaler more than every 3-4 hours	12	9
Unspecified – Shortness of Breath (SOB)		
SOB or trouble breathing is worse than yesterday for 3 consecutive calls	0	0
SOB is worse with rest or unchanged by rest	25	13
SOB or trouble breathing makes it difficult to speak in full sentences	9	5
Fever		
Fever of 101°F or greater	6	6
Fever of between 100-101°F	2	2
Feeling feverish and experiencing symptoms such as: sweating, shivering, muscle aches, headaches, or general weakness	3	3
Chest Pain		
Chest pain is worse or increasing in frequency or intensity	13	10
Chest pain combined with nausea, heavy sweating, or vomiting	17	8
Chest pain that gets better with rest or medicine	53	27
Chest pain that is unchanged with rest or medicine	0	0
Diarrhea		
Patient reported having diarrhea today	62	18
Diarrhea plus bloody, dark, or tarry stools	4	3
Diarrhea plus fever of 101°F or greater	1	1
Diarrhea plus severe abdominal pain that does not get better after a bowel movement	5	4
Vomiting		
Patient reported vomiting today	14	6
Vomiting plus blood in vomit that may be bright red, black or dark brown like coffee grounds	0	0
Vomiting plus severe abdominal pain or cramping	3	2
Vomiting plus unable to eat or drink for 12 hours or to keep down liquids for 8 hours	0	0
High or Low Blood Sugar		
Symptoms of low blood sugar plus blood sugar check in the morning was not below [low sugar threshold]	1	1
Blood sugar check in the morning was above [high sugar threshold]	1	1
Medication Management		
Patient reported not having all the medicines that were prescribed	21	18

at discharge		
Patient reported not having enough medicine to last for the next 2 weeks	32	28
Patient reported not stopping a medicine that was discontinued at discharge	5	5
Patient reported being unsure about medications	13	12
Patient reported not taking medications exactly as prescribed today: Total	141	80
(Mostly taking medications as prescribed)	(115)	(64)
(Sometimes taking medications as prescribed)	(17)	(11)
(Rarely or never taking medications as prescribed)	(9)	(5)
Patient reported experiencing medication side effects and is taking medication as prescribed	105	54
Patient reported experiencing medication side effects and is not taking medication as prescribed	12	10
Patient denied experiencing medication side effects but is not taking medication as prescribed	0	0
Patient-Centered Record		
Patient reported not receiving written discharge instructions	10	7
Patient reported not knowing where discharge instructions are located	2	2
Patient reported having questions or being unclear about discharge instructions	4	4
Patient has concerns about ability to follow discharge instructions and care for themselves	5	4
Total	683	
Total # of faxes sent to the clinics		508
Total # of unique patients triggering faxes		123

*Some patients triggered faxes for multiple reasons and some did not trigger any fax alerts.