Preparing Patients and Caregivers to Participate in Care Delivered Across Settings: The Care Transitions Intervention

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OBJECTIVES: To test whether an intervention designed to encourage older patients and their caregivers to assert a more active role during care transitions can reduce rehospitalization rates.

DESIGN: Quasi-experimental design whereby subjects receiving the intervention (n = 158) were compared with control subjects derived from administrative data (n = 1,235).

SETTING: A large integrated delivery system in Colorado.

PARTICIPANTS: Community-dwelling adults aged 65 and older admitted to the study hospital with one of nine selected conditions.

INTERVENTION: Intervention subjects received tools to promote cross-site communication, encouragement to take a more active role in their care and assert their preferences, and continuity across settings and guidance from a transition coach.

MEASUREMENTS: Rates of postdischarge hospital use at 30, 60, and 90 days. Intervention subjects' care experience was assessed using the care transitions measure.

RESULTS: The adjusted odds ratio comparing rehospitalization of intervention subjects with that of controls was 0.52 (95% confidence interval (CI) = 0.28–0.96) at 30 days, 0.43 (95% CI = 0.25–0.72) at 90 days, and 0.57 (95% CI = 0.36–0.92) at 180 days. Intervention patients reported high levels of confidence in obtaining essential information for managing their condition, communicating with members of the healthcare team, and understanding their medication regimen.

CONCLUSION: Supporting patients and caregivers to take a more active role during care transitions appears promising for reducing rates of subsequent hospitalization. Further testing may include more diverse populations and patients at risk for transitions who are not acutely ill. **J Am Geriatr Soc 52:1817–1825, 2004.**

Key words: care transition; care coordination; self-management; chronic illness

Older adults moving between different healthcare settings are particularly vulnerable to receiving fragmented care.[1,2] Healthcare delivery is ostensibly divided into discrete loci of care that often function in isolation of one another. Financial, regulatory, and professional barriers serve to further reinforce these silos of care such that care coordination across settings is often lacking.[2–4] When practitioners in different settings operate independently with no common care plan, older patients may be adversely affected. Problems include conflicting recommendations regarding chronic disease self-management, confusing medication regimens with a high potential for error and duplication, lack of follow-up care, and inadequate patient and caregiver preparation for receiving care at the next healthcare setting.[2,5–10] Poorly executed care transitions can further lead to greater use of hospital and emergency services, increasing healthcare costs.[11–14]

Despite the critical need to reduce fragmented care in this population, few interventions have been developed to assist older patients and their family members in making smooth transitions. Interventions for patients hospitalized with congestive heart failure (CHF)[15,16] and for a variety of medical and surgical diagnoses[17–19] have been tested, and many have demonstrated reductions in subsequent postdischarge hospital use. In each case, these interventions involved the addition of an advanced practice nurse who intensively managed patients during the transition out of hospital and into the home. Patients involved with these interventions were relegated to a primarily passive rather than an active role in their care, with little emphasis on self-management.

Because patients and their caregivers are often the only common factor moving across sites of care, they are the most appropriate targets for an intervention designed to improve care transitions. This study tests whether an intervention designed to encourage older patients and their caregivers to assert a more active role in their care

transitions can reduce subsequent use of hospital and emergency services.

METHODS

Study Setting

The intervention was conducted in collaboration with a large not-for-profit group-model managed care delivery system located in Colorado that cares for more than 56,000 patients aged 65 and older. The delivery system does not own an acute care hospital or postacute care facilities. Rather, it contracts with a single hospital, eight different skilled nursing facilities (SNFs), and a single home health-care agency in the Denver metropolitan area. Physicians employed by the delivery system are permitted to serve as inpatient hospitalists in the acute care facility. In general, practitioners did not follow patients across care settings. The institutional review board of the participating health system and the University of Colorado Health Sciences Center (protocol 01–139) approved the study protocol.

Study Subjects

Intervention patients (n = 158) were recruited directly from the contract hospital. Control patients (n = 1,235) were recruited from the health delivery system's administrative records. For both study populations, inclusion criteria included patients aged 65 and older hospitalized between July 1, 2001, and September 1, 2002, and enrolled in the participating health system as of July 1, 2001. For control patients, the first hospitalization that occurred during the study period was selected as the index hospitalization. Intervention and control patients had to have at least one of nine diagnoses, chosen because of their high likelihood for requiring posthospital SNF or home health care (and thus experiencing another care transition). These diagnoses included CHF, chronic obstructive pulmonary disease (COPD), coronary artery disease, diabetes mellitus, stroke, medical and surgical back conditions (predominantly spinal stenosis), hip fracture, peripheral vascular disease, and cardiac arrythmias.[20] In addition, eligible patients had to reside in the community (i.e., not in a long-term care institution) before and after hospitalization. Elective admissions to the contract hospital were excluded.

Because there were more patients admitted to the hospital than could be enrolled into the intervention, a trained study nurse used a random number generator to select newly admitted patients to be screened for eligibility; 638 charts were reviewed to determine initial eligibility for the intervention. Based on this review, 427 patients did not meet eligibility criteria. After being approached, 53 patients refused participation. Patients who refused did not significantly differ from those who consented with respect to age, sex, and admitting diagnosis. The remaining 158 patients provided informed consent to participate in the intervention.

The Care Transitions Intervention

The overriding goal of the intervention was to improve care transitions by providing patients and their caregivers with tools and support to encourage them to more actively participate in the transition from hospital to home. A comprehensive description of the intervention is provided elsewhere.[21] In brief, the intervention comprises four conceptual areas, referred to as pillars. These pillars directly correspond to the content areas that patients and caregivers who recently underwent posthospital care transitions expressed as most essential and most needed.[9]

-   medication self-management
-   a patient-centered record
-   primary care and specialist follow-up
-   knowledge of "red flags" warning symptom or sign indicative of a worsening condition

The relationship between the four pillars and the specific goals and tasks for each stage of the intervention is illustrated in Table 1. The four pillars were operationalized through two mechanisms: a Personal Health Record and a series of visits and telephone calls with a transition coach. These mechanisms are designed to empower and educate older patients to meet their healthcare needs and promote care coordination and continuity across settings postdischarge.

The Personal Health Record (Appendix 1) is a patient-centered document that consists of the core data elements for facilitating productive patient-practitioner encounters across settings. Core data elements include an active problem list; medications and allergies; a list of red flags, or warning symptoms or signs that correspond to the patient's chronic illness(es); a transfer checklist of important activities that need to take place before discharge (such as a discussion on which medications to take and when a follow-up appointment should be scheduled); and space for the patient to record questions and concerns. The patient and caregiver maintain and update the Personal Health Record with assistance from the transition coach.

The primary function of the transition coach was to encourage self-management and direct communication between the patient/caregiver and primary care provider rather than to function as another healthcare practitioner per se. The transition coach did not influence predischarge hospital care or hospital length of stay. In this study, a geriatric nurse practitioner with a master training certification in chronic disease self-management[22] served as the transition coach. The older patient, caregiver, and transition coach collaborated to ensure that the appropriate practitioners were involved and understood what took place in the prior healthcare setting, critical issues in managing comorbid conditions were addressed, treatment goals were understood, and the care plan was executed correctly. The design of the intervention reflects the fact that patients are generally not encouraged to self-manage their conditions in hospitals or SNFs. Thus, the intervention is most intense during the period when the patient leaves an institution and makes the transition back to community living.

The transition coach established rapport with the patient in the hospital, introduced the Personal Health Record and the intervention activities checklist (Appendix 1), and made arrangements to maintain continuity with the patient after discharge. After hospital discharge, the role of the coach varied depending on the patient's discharge destination. For patients transferred to a SNF, the transition coach phoned or visited the patient at least weekly to monitor progress, facilitate preparation for discharge, and arrange for a home visit. For patients transferred to home, the

Table 1. Care Transitions Intervention Activities by Pillar and Stage of Intervention

Pillar	Medication Self-Management	Dynamic Patient-Centered Record	Follow-Up	Red Flags
Goal	Patient is knowledgeable about medications and has a medication management system.	Patient understands and uses a Personal Health Record (PHR) to facilitate communication and ensure continuity of care plan across providers and settings; patient manages the PHR.	Patient schedules and completes follow-up visit with primary care provider (PCP)/specialist and is empowered to be an active participant in these interactions.	Patient is knowledgeable about indications that condition is worsening and how to respond.
Hospital visit	Discuss importance of knowing medications and having a system in place.	Explain PHR.	Recommend PCP follow-up visit.	Discuss symptoms and drug reactions.
Home visit	Reconcile pre- and posthospitalization medication lists. Identify and correct any discrepancies.	Review and update PHR. Review discharge summary. Encourage patient to update and share the PHR with PCP and specialist at follow-up visits.	Emphasize importance of the follow-up visit and need to provide PCP with recent hospitalization information. Practice and role-play questions for PCP.	Assess condition. Discuss symptoms and side effects of medications.
Follow-up calls	Answer any remaining medication questions.	Remind patient to share PHR with PCP/specialist. Discuss outcome of visit with PCP or specialist.	Provide advocacy in getting appointment, if necessary.	Reinforce when/if PCP should be called.

transition coach scheduled a home visit within approximately 24 to 72 hours.

The home visit involved the patient and available informal caregiver, if applicable. A primary goal of the visit was to reconcile the patient's prehospital medication regimen with the posthospital medication regimen. The transition coach helped the patient understand each medication (purpose, instructions for use, and common side-effects). When medication discrepancies were identified, the transition coach encouraged the patient or caregiver to telephone the physician's office or make an appointment to be seen in person. The patient and transition coach then rehearsed or role-played for the upcoming encounter to ensure that the patient would be able to clearly articulate his or her needs. An additional goal of the home visit was to help the patient recognize red flags or warning symptoms or signs that his or her health condition was worsening. The transition coach then educated the patient as to the initial steps to take to manage the exacerbation and how to contact the appropriate healthcare practitioner.

The transition coach telephoned the patient at least three times posthospitalization. During the first telephone call, the transition coach ascertained whether the patient had obtained prescribed medications and ordered services, inquired about the presence of symptoms, and arranged for a home visit. In subsequent calls, the patient and transition coach reviewed progress made toward goals established during the home visit, discussed what transpired at follow-up appointments, reinforced the value of using the Personal Health Record, provided encouragement for the patient to assert his or her preferences during upcoming encounters with practitioners, and supported the patient's role in chronic illness self-management. The transition coach was involved with any given intervention patient for approximately 24 days after discharge to home.

Measures and Data Collection

Utilization data abstracted from the participating health system's administrative data files included use of hospital emergency and observation unit (henceforth referred to as emergency department (ED)) use for intervention and control patients beginning 1 year before their index hospital admission and extending 6 months after discharge. Data on patient demographics and diagnoses were also abstracted from health system administrative records. Pharmacy data were used to derive a comorbidity index: the chronic disease score.[23] Chronic disease scores have been associated with physician-rated patient disease severity, patient-rated health status, hospitalization, and mortality.[23,24]

The Care Transition Measure (a patient-centered measure of the quality of care transitions) was administered via telephone to assess patient report of certain care processes.[25] Only intervention patients were assessed using this instrument, because the study protocol did not include direct contact with controls. Between 24 and 28 days after hospital discharge, a study research assistant made as many as five attempts to complete a telephone interview with each intervention patient.

In a previous study of Medicare beneficiaries, the authors developed a taxonomy for categorizing the pattern of posthospital care transitions using administrative data.[14]

Table 2. Description of Study Sample

Variable	Intervention Group (n = 158)	Control Group (n = 1,235)	P-value
Age, mean ± SD	75.10 ± 6.44	78.48 ± 7.50	<.001
Female, %	53.8	55.4	.71
Medicare and Medicaid recipients, %	0.6	3.8	.03
Congestive heart failure, %	25.3	31.6	.11
Coronary artery disease, %	56.3	70.6	<.001
Chronic obstructive pulmonary disease, %	35.4	37.1	.68
Diabetes mellitus, %	24.1	24.1	.99
Stroke, %	6.3	14.0	.007
Hip fracture, %	8.9	16.3	.02
Peripheral vascular disease, %	6.3	5.3	.60
Medical and surgical back conditions, %	10.1	2.3	<.001
Chronic disease score, mean ± SD	8.70 ± 6.06	7.67 ± 5.83	.04
Length of stay for index hospitalization, mean ± SD	6.73 ± 3.85	4.92 ± 3.39	<.001
Index hospitalization discharge destination, %			<.001
Home without home health care	53.8	47.4	
Home with home health care	29.1	18.9	
Skilled nursing facility	15.8	28.0	
Other	1.3	3.9	
Died	0.0	1.9	
Prior hospitalization, %	20.8	24.6	.30
Length of stay for prior hospitalizations, mean ± SD	1.27 ± 3.52	1.71 ± 3.98	.19
Prior use of emergency department or observation unit (combined), %	46.1	42.2	.36
Number of prior emergency department or observation unit visits (combined), mean ± SD	0.99 ± 1.54	1.02 ± 1.86	.85

Note: Chi-square test was used for categorical variables, and *t*-test was used for continuous variables to test significance across intervention and control groups. Behrens-Fisher test was used for unequal variances.
SD = standard deviation.

An episode was defined as the 30-day period after hospital discharge. An uncomplicated posthospital care transition was defined as one or more transfers from higher-intensity care environments (in which it is presumed that patients have greater functional dependency) to lower-intensity care environments (in which it is presumed that patients have less functional dependency). In contrast, a complicated posthospital care transition was defined as one or more transfers from lower- to higher-intensity care environments. By way of example, an episode in which a patient was transferred from the hospital to a SNF and then to home, would be categorized as uncomplicated, but an episode that included transfer from a hospital to the patient's residence and then back to the hospital or ED without hospital admission within 30 days would be categorized as complicated. Thirty-day posthospital care patterns for intervention and control subjects were compared using this taxonomy.

Statistical Analysis

The prespecified primary study outcome was rehospitalization rates at 30, 90, and 180 days. Initial two-sample comparisons of the intervention and control groups were conducted using appropriate statistical tests (e.g., Wilcoxon test for nonnormally distributed continuous variables, Fish-

er exact test for dichotomous variables). Using logistic regression and Cox regression, comparisons of utilization were adjusted for baseline differences in age, sex, Medicaid status, chronic disease score, stroke, hip fracture, CHF, COPD, diabetes mellitus, coronary artery disease, peripheral vascular disease, medical and surgical back conditions, cardiac arrhythmia, prior hospitalizations, index length of stay and prior hospitalizations (cumulative number of days), prior use and number of ED visits, and index hospitalization discharge destination. Utilization outcomes included nonelective rehospitalization and use of the ED at 30, 90, and 180 days. All consented intervention patients were included in the analyses. Time to first rehospitalization and time to first return to the ED were analyzed using Kaplan-Meier estimates and Cox regression models. The intervention variable was tested for proportional hazards. Reasons for possible censoring included death, disenrollment, and date of study completion.

RESULTS

Demographic, diagnostic, comorbidity, and utilization differences of intervention and control subjects are compared in Table 2. Overall, control subjects were older and more likely to receive Medicare and Medicaid insurance (i.e., dually

eligible). Intervention subjects were significantly less likely to have experienced a stroke, hip fracture, or coronary artery disease yet had a higher burden of comorbidity as measured using the chronic disease score. The two groups did not differ with respect to prior hospital or ED utilization, but the average length of stay for the index hospitalization was longer for intervention than control subjects.

Ninety-one percent of intervention patients received a home visit from the transition coach; 72% received three or more telephone calls. Ninety-nine percent of intervention patients completed the follow-up telephone-administered measure of their care transition experience assessed using the care transitions measure. The majority of intervention patients reported confidence in self-management (75%), understanding warning symptoms or signs indicative of a worsening health condition (75%), and the ability to obtain needed information during a follow-up physician visit (87%). Similarly, the majority of intervention patients reported understanding the reason for taking each medication (87%) and how to take each medication (94%). A smaller proportion (69%) reported an understanding of the side effects of all of their medications.

Rates of rehospitalization and return to the ED of intervention and control subjects were compared at 30, 90, and 180 days (Table 3). These analyses were adjusted for age; chronic disease score; discharge destination of index hospitalization; length of stay for the index hospitalization; use of hospital and emergency services before the index hospitalization; and prevalence of diagnoses, including CHF, stroke, hip fracture, coronary artery disease, COPD,

and peripheral vascular disease. The odds ratio (OR) comparing rehospitalization of intervention subjects with controls was 0.52 (95% confidence interval (CI) = 0.28–0.96) at 30 days, 0.43 (95% CI = 0.25–0.72) at 90 days, and 0.57 (95% CI = 0.36–0.92) at 180 days. The OR comparing return to the ED of intervention subjects with that of controls was 0.76 (95% CI = 0.44–1.30) at 30 days, 0.61 (95% CI = 0.39–0.95) at 90 days, and 1.16 (95% CI = 0.78–1.72) at 180 days. The median number of days until first rehospitalization was 225.5 days and 217.0 days for intervention and control subjects, respectively (hazard ratio (HR) = 0.58, 95% CI = 0.41–0.83). The median number of days until first return to the ED was 192.5 and 193.0 for intervention and control subjects, respectively (HR = 0.88, 95% CI = 0.67–1.17). Using the quality of care transitions taxonomy, 9.5% of intervention posthospital transitions were deemed complicated, versus 14.9% of control transitions ($P = .35$).

DISCUSSION

In this study, hospitalized subjects who received the patient-centered intervention designed to enhance their role in managing transitions were approximately half as likely (in odds) to return to the hospital as subjects who did not receive the intervention. As evidenced by the comparative hospitalization rates at 30, 90, and 180 days, there was a sustained intervention effect over time, well beyond the 24 days of contact with the transition coach. Intervention

Table 3. Utilization Outcomes

Variable	Intervention (n = 158)	Control (n = 1,235)	P-value (2-tailed)	Adjusted* OR/HR (95% Confidence Interval)	Adjusted* P-value (2-tailed)
Complicated posthospital episode, %	9.5	14.9	.092	0.74 (0.38–1.46)	.35
Rehospitalized within 30 days, %	8.9	13.8	.092	0.52 (0.28–0.96)	.04
Rehospitalized within 90 days, %	13.5	22.9	.007	0.43 (0.25–0.72)	.002
Rehospitalized within 180 days, %	22.9	32.0	.033	0.57 (0.36–0.92)	.02
ED or observation unit visit within 30 days, %	11.0	14.2	.270	0.76 (0.44–1.30)	.40
ED or observation unit visit within 90 days, %	18.3	25.7	.046	0.61 (0.39–0.95)	.03
ED or observation unit visit within 180 days, %	37.1	36.0	.807	1.16 (0.78–1.72)	.48
Time to first rehospitalization, median days[†]	225.5	217.0	.008	0.58 (0.41–0.83)	.003[‡]
Time to first ED or observation unit visit, median days[†]	192.5	193.0	.563	0.88 (0.67–1.17)	.69[‡]

Note: Chi-squared test was used for dichotomous outcomes, and log-rank test was used for time to event outcomes, testing statistical significance between intervention and control groups.

Logistic regression was used for dichotomous outcomes, and Cox regression was used for time-to-event outcomes, testing statistical significance between intervention and control groups and adjusting for covariates.

* These analyses were adjusted for baseline differences in age, sex, Medicaid status, chronic disease score, stroke, hip fracture, congestive heart failure, chronic obstructive pulmonary disease, diabetes mellitus, coronary artery disease, peripheral vascular disease, medical and surgical back conditions, cardiac arrhythmia, prior hospitalizations, length of stay of index and prior hospitalizations, prior use and number of emergency department (ED) visits, and index hospitalization discharge destination.

[†] Or censored time (death, disenrollment, or end of study).

[‡] Null hypothesis: Hazard ratio (HR) = 1.

OR = odds ratio.

patients reported high levels of confidence in obtaining essential information for managing their condition, communicating with members of the healthcare team, and understanding their medication regimen.

The findings of this study need to be considered in light of previous research. In comparing the utilization findings of this study with prior investigations that have attempted to improve coordination of posthospital care, the reduction in rehospitalization rates reported herein is of similar magnitude.[15–17] The reduction in hospitalization rates in this study is similar to those reported in prior investigations that attempted to improve coordination of posthospital care. A previous study targeted a much more frail population than the current study, and the advanced practice nurse assumed a more intense role in patients' management.[17] In addition, patients in the previous study's intervention were not explicitly taught transition self-management skills, nor were they encouraged (or perhaps able) to play a more active role in their transitional care. As a consequence, the previous study's intervention was not necessarily designed to be sustained in subsequent care episodes or in different care settings, such as skilled nursing or rehabilitation facilities or outpatient clinic settings.

Another study reported an intervention aimed at evaluating the effect of a comprehensive geriatric assessment that was initiated before hospital discharge and continued into the home.[19] The intervention in that study targeted a more frail population than did the current study, and the role of the nurse practitioner was much more intense. In addition, that study attempted to conduct a thorough review to address the patients' overall geriatric care needs, not simply the transitional care needs. The advance practice nurse worked closely with a geriatrician, social worker, and physical therapist to attempt to enhance primary care physicians' adherence to their collective recommendations, which was not a focus of the design of the current study.

Furthermore, comparisons with interventions reported in the literature need to also take into account the fact that the reduction in utilization rates reported herein reflect the efforts of a single transition coach rather than a cadre of advance practice nurses.[15–19] Although the transition coach had contact with the patient in the hospital, at home, and over the telephone, the intensity of these encounters was much less because she was primarily encouraging the patient and caregiver to obtain their care needs met, rather than providing the care herself. The less-intensive role of the transition coach afforded the opportunity for a larger panel size (i.e., patient-to-practitioner ratio).

Finally, the reported high levels of confidence in essential self-management skills and the associated reduction in healthcare utilization are comparable with the findings of other interventions.[26,27]

The care transition intervention needs to be considered in the broader context for the need to improve the quality of geriatric care. The fundamental design of this approach is aligned with multiple national priority areas, including advancing patient-centered care, support for shared decision-making, promoting patient safety, particularly as it relates to medication use, and controlling escalating Medicare costs.[3,28,29] Reducing unnecessary utilization is in the interest of all involved parties, including patients and their caregivers, practitioners, quality improvement organizations, and third-party payers such as the Centers for Medicare and Medicaid Services.

Although a formal cost-effectiveness analysis is beyond the scope of this quasi-experimental study, the costs of this intervention are relatively straightforward. Annual salary and benefits for the general nurse practitioner totaled $67,600, annual costs for a cell telephone and pager totaled $600, annual mileage expenses totaled $2,400, and annual costs for reproduction of the Personal Health Record and other supplies totaled $100. This total of $70,700 in costs was for 12 months. The study lasted 8 months, and hence actual costs were $47,133. At any given time, the transition coach managed a panel of approximately 20 patients, each at a different stage of the intervention.

These costs are weighed against the productivity of the transition coach and the potential reduction in rehospitalization rates. The actual cost of a hospital day in the participating health delivery system is not known because hospital costs are based on a complex formula that is proprietary and not available to the research team, but by reducing hospitalizations or days in the hospital, the intervention has the potential at least to pay for itself.

The intervention was specifically designed to be compatible within Medicare capitated and fee-for-service payment systems. The financial incentives of capitated payment are well aligned to support an intervention designed to better integrate care across settings and reduce subsequent use of acute services such as hospitalization. The managed care organization would likely assume the cost of the transition coach.

In a fee-for-service payment environment, financial incentives exist but are less apparent. There are incentives, for example, for acute care hospitals. Many hospitals across the country are operating at capacity and frequently need to divert patients to other hospitals.[30,31] Hospitals operating in these environments have a financial incentive to facilitate transfer of complex older patients for whom reimbursement is less favorable to other care settings (such as SNFs) to create bed capacity for patients for whom reimbursement is more favorable (e.g., orthopedic surgery and intervention cardiology patients). An additional financial incentive for effective care transitions concerns rehospitalization. When patients are rehospitalized for the same condition shortly after discharge, the hospital may have to cover the costs of the subsequent stay under the initial diagnosis related group.[32] Although bundling of acute and postacute care services currently only exists for a small number of conditions, there is interest at the federal level in expanding this approach to a broader range of diagnoses.[33] Furthermore, national efforts that will encourage the adoption of a single quality measure (i.e., the Hospital Consumer Assessment of Health Plans, which will include items on hospital discharge) by which all participating institutions are judged and then paid for performance may represent an additional incentive for hospitals to focus their attention on ensuring safe and effective discharges.[34] Finally, accreditation by the Joint Commission on Accreditation of Healthcare Organizations includes items on continuity of care for discharged patients. For one or more of these reasons, a hospital may choose to invest in the services of a transition coach.

Alternatively, existing healthcare practitioners may assume some of the specific roles of the transition coach. For example, discharge planners or home health nurses are

positioned to play a more active role in care transitions, engaging the patient and family members to promote greater participation in the process. Disease management and general case managers could also take on some transition coach functions. Primary care physicians could be compensated for becoming more involved in the transitions of patients eligible for Medicare home health care.[35]

A strength of the care transitions intervention is its simplicity and relatively low cost to implement, facilitating wide-scale adoption. The intervention is applicable to a broad range of acute and chronic conditions. To the authors' knowledge, this is the first study to attempt to enhance patient (and caregiver) self-management skills pertaining to transitions across care settings. As evidenced by the high proportion of patients willing to have the transition coach visit them in their homes and participate in follow-up telephone calls, the intervention is user-friendly with a high degree of receptivity in the target audience.

With respect to limitations, these results are based on a single, large, integrated health delivery system in Colorado and may not be generalizable to other patient populations. Although the control group was constructed to be representative of hospitalized patients who would have been eligible to participate in this intervention and risk-adjustment techniques were employed to further ensure comparability, it was nevertheless derived from administrative data sources. A wide range of variables from which to adjust the results of the analyses were employed, but the possibility that unmeasured differences between groups may have influenced the findings cannot be eliminated. Furthermore, subjects' responses to the individual care transition measure items were not confirmed. In addition, physician satisfaction data were not collected, and therefore the acceptability of the intervention cannot be commented on from their perspective. Finally, identifying patients at the point of hospitalization and implementing an intervention represents a relatively downstream (late) approach to affecting positive care experiences and outcomes. Yet the nature of this intervention and the accompanying results suggest a potential effect for such an approach further upstream (earlier), whereby nonacutely ill patients may have greater ability to acquire skills needed to more actively participate in transitions, as well as create a contingency plan for how their needs would be met during future episodes of illness.[36]

The care transition intervention fills an important gap in intervention studies designed to improve the quality of care transitions. The content of this intervention is closely aligned with national efforts aimed at supporting patient-centered care, shared decision-making, care coordination, patient safety, and cost control. The intervention was acceptable to patients and caregivers and effective in supporting self-management of transitions and reducing the need to receive subsequent hospital care. Future testing of the intervention needs to be conducted in diverse populations and in patients who are at risk for hospital and SNF utilization but who are not acutely ill.

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APPENDIX

Personal Health Record

If you have questions or concerns,
Contact (_____)
at (____) ____-_____

REMEMBER
to take this Record with you
to all your doctor visits

The Personal Health Record of:

_____

Personal Information
Address:

Home Phone#:
Alternate Phone #:
Birth Date:
Hospital ID #:
PCP Name:
Advance Directives?:

Hospitalization Information
Admitted:__/__/__ Discharged:__/__/__
Reason for Hospitalization:

Caregiver Information
Name:
Home Phone #:
Alternate Phone #:
Relation to Patient:

Medical History

❑ Arthritis
❑ Abnormal Heart Rhythm
❑ Cancer
❑ Diabetes
❑ Hardening of the Arteries
❑ Heart Disease
❑ Heart Failure
❑ High Blood Pressure
❑ Hip Fracture
❑ Lung Disease
❑ Medical/Surgical Back conditions
❑ Pneumonia
❑ Stroke
Other Diagnoses:

To better manage my health and medications, I will...

- Take this Personal Health Record with me wherever I go, including ALL doctor visits and future hospitalizations.

- Call my doctor if I have questions about my medications or if I want to change how I take my medications.

- Tell my doctors about ALL medications I am taking, including over-the-counter drugs, vitamins, and herbal formulas.

- Update my Medication Record with any changes to my medications.

- Know why I am taking each of my medications.

- Know how much, when, and for how long I am to take each medication.

- Know possible medication side effects to watch out for and what to do if I notice any.

Medication Record (Sample)

Name	Dose	Reason	New?
Azmacort MDI	4 puffs 2 times a day	Emphysema	N
Oxygen	2 liters per minute	Emphysema	N
Triam/HCTZ	75/50 : take½ pill once per day	Leg swelling	Y
Warfarin	5 mg once per day	Blood thinner	N
Atenolol	25 mg once per day	Blood pressure	N
Atorvastatin	10 mg at bedtime	Cholesterol	N
Multivitamin	once per day	Nutrition	N

<u>Allergies</u>: Penicillin → Rash

Notes for My Primary Care Physician:

1. Do I need to take the Triam/HCTZ even when I do not have swelling?
2. How long will I receive home health care?
3. When is my next blood draw to check the Warfarin?

_____   _____

Intervention Activities Checklist

Before I leave the care facility, the following tasks should be completed:

❏ I have been involved in decisions about what will take place after I leave the facility.

❏ I understand where I am going after I leave this facility and what will happen to me once I arrive.

❏ I have the name and phone number of a person I should contact if a problem arises during my transfer.

❏ I understand what my medications are, how to obtain them, and how to take them.

❏ I understand the potential side effects of my medications and whom to call if I experience them.

❏ I understand what symptoms I need to watch out for and whom to call should I notice them.

❏ I understand how to keep my health problems from becoming worse.

❏ My doctor or nurse has answered my most important questions prior to my leaving the facility.

❏ My family or someone close to me knows that I am coming home and what I will need once I leave the facility.

❏ If I am going directly home, I have scheduled a follow-up appointment with my doctor, and I have transportation to this appointment.