The Impact of Kaua'i Care Transition Intervention on Hospital Readmission Rates

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ABSTRACT

Objectives: To evaluate the effects of Kaua'i Care Transition Intervention (KCTI), a patient-centered intervention program, on reducing hospital readmission rates among patients 60 years or older.

Study Design: A prospective quasi-experimental prepost design.

Methods: Hospital admissions data for the year 2010 (January 1 to December 31) served as the baseline data and were used to identify patients at risk of hospital readmission. KCTI was implemented over a 12-month period from April 1, 2012, to March 31, 2013, and 30-day, 60-day, and 1-year readmission rates were assessed for both the intervention and baseline periods. The impact of the intervention was examined by a logistic regression model, controlling for possible patient population differences.

Results: During the intervention period, a total of 269 patients 60 years or older were admitted to the hospital, of which, 58 were referred to the KCTI program. Logistic regression controlling for patients' primary health insurance, discharge sites, and certain admitting diagnoses (eg, arrhythmias, cellulitis, chronic obstructive pulmonary disease) found that the intervention reduced the 30-day readmission rate by two-thirds (odds ratio [OR], 0.34; $P = .003$). Readmission rates within 60 days (OR, 0.42; $P < .01$) and within a year (OR, 0.48; $P < .001$) during the intervention period were less than half of the baseline rates.

Conclusions: By selecting patients with identified risk factors, then empowering and educating them with the intervention program, this study was successful in reducing hospital readmission rates. This study also demonstrated the value of carefully selecting patients for intervention programs.

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Readmissions currently remain a costly component of Medicare-covered hospital services, accounting for an estimated $17.4 billion of Medicare spending.[1] As early as the 1980s, 22% of Medicare patients were readmitted within a 60-day period, costing the system over $8 billion per year, or 24% of Medicare inpatient expenditures.[2] More recently, studies have reported readmission rates of more than 50% for specific conditions or when the window for readmission is extended beyond the 60-day period.[1,3] For example, Jencks et al reported that 19.6% of Medicare patients in nonmanaged care acute hospital settings were readmitted to the hospital within 30 days, with 34% within 90 days, and more than half (56.1%) within 1 year of discharge.[1]

Targeting patients at risk for early readmission has been suggested as one way to reduce hospital readmission rates and Medicare expenditures. Risk factors commonly identified for hospital readmissions include measures of health status, certain diagnoses (eg, sickle cell anemia, gangrene, hepatitis, heart failure, acute myocardial infarction, or pneumonia), a history of recent surgery, advanced age, and 5 or more medical comorbidities.[3-9] Using Medicare claims data, Arbaje et al found that being unmarried, living alone, lacking self-management skills, and having an unmet activity of daily living all increased the risk of readmission.[10] The term "social instability," which reflects a relative lack of social support, education, economic stability, access to care, and safety in the patient's post discharge environment, is an important mediator of readmission risk.[9-12]

Several different types of interventions have been tested in the field to determine the possibility of reducing both the likelihood and the number of readmissions among older patients. These endeavors can be characterized as being on a continuum from clinical and medical interventions to social and educational efforts.[13-19] Among them, the Care Transition Intervention (CTI), also known as the "Coleman Model,"

has shown promising results in reducing hospital readmissions both in randomized trials and in real-world open healthcare delivery systems.[15,16] CTI is a patient-centered intervention that focuses on empowering high-risk patients to better manage their illnesses through a home visit and telephone calls by trained transition coaches.[15,20]

Based on the promising findings from CTI, the County of Kaua'i Agency on Elderly Affairs (KAEA), in partnership with Kaua'i Veterans Memorial Hospital (KVMH), initiated the Kaua'i Care Transition Intervention (KCTI) in 2012. The goal of the program, implemented over a 12-month period from April 1, 2012, to March 31, 2013, was to empower and educate high-risk elderly patients to effectively manage their health; to streamline, align, and coordinate home- and community-based services to support aging in place; and ultimately, to reduce hospital readmissions. We hypothesized that the KCTI program would reduce the facilitywide, all-cause 30-day readmission rate at KVMH, as well as reduce all-cause 60-day and 1-year readmission rates there.

Take-Away Points

- This study demonstrated that empowering and educating high-risk elderly patients to effectively manage their health helps reduce the risk of rehospitalization.
- By enrolling only patients with identified risk factors, this study was successful in reducing 30-day, 60-day, and 1-year hospital readmission rates.
- This study identified, at baseline, multiple diagnoses as risk factors of readmission to be targeted for the intervention, a unique approach compared with most studies, in which a single diagnostic group is usually identified and targeted.
- This study demonstrated the value of carefully selecting patients for the intervention programs.

METHODS

KVMH is a general medical and surgical hospital with 45 beds, including 15 acute and 30 acute/skilled nursing facility (SNF) swing and intermediate-care facility (ICF) beds. Its patient population is mainly composed of people aged 60 years and older who reside in West Kaua'i in the state of Hawaii. The total population of Kaua'i was 67,091 in 2010, of which about 15% were 65 years or older.[21]

Inclusion and Exclusion Criteria

Baseline preliminary analysis of hospital admission data for patients 60 years or older in the year 2010 identified several high-risk groups of patients. These included patients with severe respiratory/pulmonary diseases (ie, chronic obstructive pulmonary disease [COPD], pneumonia), cardiac-related diseases (ie, arrhythmia/congestive heart failure), sepsis, and cellulitis. Patients discharged or transferred to SNF, ICF, or other acute hospitals were also associated with an increased likelihood of readmission compared with patients discharged to home. Those risk factors therefore served as selection criteria for patients to be referred to the KCTI program.

To be enrolled into the KCTI program, a patient needed to be 60 years or older and present with 1 or more of the following admitting diagnoses: 1) severe respiratory/pulmonary disease, 2) cardiac-related disease, 3) sepsis, or 4) cellulitis.

Conversely, several groups of patients were specifically excluded from the study, including: 1) cognitively impaired patients who lacked a primary caregiver, 2) active substance abusers not in a treatment or recovery program, 3) patients with acute mental illness, and 4) long-term nursing home residents.

The KCTI Program

The KCTI program was a 4-week-long intervention that utilized a trained coach (a board-certified occupational therapist) who followed patients upon discharge from the hospital. Referrals to the program were made by a physician or any member of the hospital multidisciplinary team and were coordinated by the hospital social services department.

Initial patient–coach contacts were made in the hospital. The first home visit generally occurred within 24 to 72 hours after discharge. Both the patient and the caregiver received the coaching if the caregiver was available. During this visit, the coach reviewed the patient's discharge plan and ensured that they were adhering to the treatment protocol, complying with medication instructions, scheduling follow-up appointments with their primary care physician, and attuned to recognize warning signs and symptoms of worsening conditions. As part of this process, the patient received a personal health record (PHR) on which to record their medical history, medications, and allergies. They were encouraged to bring this record to future physician office visits so they could record any updates of their medical information. The coach also roleplayed effective communication strategies with the patient to prepare them to clearly articulate their needs to their primary physician or other healthcare professionals.

After the initial home visit, the coach telephoned once a week to monitor the patient's progress and address any questions or concerns. The coach also referred patients, if interested, to the KAEA or other agencies for an array of home- and community-based programs that might

further assist their home care. Overall, the care transition program followed the patient for up to 4 weeks with 3 telephone calls. If they wished, patients could also initiate contact with the coach. There was a 1-month follow-up mailed client survey. Patients readmitted within 30 days were referred back to the program.

Data Sources

Hospital data for fiscal year 2010 were used as baseline data to examine risk factors associated with readmission. Data from the intervention period, April 1, 2012, to March 31, 2013, were used to examine whether the intervention was able to reduce hospital readmission rates. Only patients 60 years or older were included in the analysis. Whether a patient was readmitted within 30 days, 60 days, or 1 year was determined by the interval in days between the patient's index discharge date and first readmission date during the intervention period. Although a patient can be readmitted more than once, only the first readmission during the intervention period was used. Only admissions to acute beds, including those in the medical, surgical, or intensive care units, were considered for the determination of whether a patient was readmitted and the total number of admissions. Transfers of patients from acute beds to SNF or ICF beds were not considered as meeting the definition of readmission.

Other variables examined included length of stay, sex, types of admitting medical services, age at admission, patient's primary insurance, discharge site, and primary, secondary, and tertiary diagnosis. Patient's primary insurance was reduced to 4 categories: Hawaii Medical Service Association (HMSA), Medicare, HMSA/65C+, and other (all other private insurances available in Hawaii [eg, Alohacare Advantage, Ohana/Wellcare Medicare Advantage Plan]). HMSA is the largest insurance company, providing medical insurance for more than 80% of Hawaiian residents. Discharge sites were reduced into 3 categories: home (with or without home health), skilled nursing facility (including swing beds and ICF placement), and all other sites (eg, other acute hospitals). Due to the small number of patients with COPD or cellulitis as the primary admitting diagnosis, the presence of these 2 conditions among the first 3 admitting diagnoses were used instead.

Statistical Analysis: Primary Outcomes of Hospital Readmission Rates

Chi-squared test or independent *t* test were used to describe patient characteristics, including mean age of patients, average length of stay, major types of admitting medical services, discharging sites, and primary health insurance. Frequency counts of patients' primary, secondary, and tertiary admitting diagnoses were provided. Number of referrals to the intervention program and number of patients completing the program were provided.

Chi-squared tests were initially used to evaluate whether readmission rates within 30 days, 60 days, or 1 year differed significantly between intervention period and baseline. To verify that any observed difference in the readmission rates between the intervention period and baseline was due to the intervention rather than other factors (eg, patient characteristics), χ^2 tests were used to compare categorical patient characteristics between the 2 time periods, including patient's sex, discharge sites, patient's primary insurance, and admitting medical services. Independent *t* tests were used to compare patient characteristics such as age and length of stay. If the hospital patient populations were found to differ significantly between baseline and the intervention period on any of those characteristics, a logistic regression model was then used to evaluate the effectiveness of the intervention while controlling for those patient characteristics.

Overall quality of the KCTI program was evaluated by the 3-item Care Transition Measure. Responses to each of the 3 questions are scored on a 4-point Likert Scale: total scores are the sum of the responses across those 3 items, with lower scores indicating a poorer quality transition and higher scores indicating a better transition.[22]

RESULTS

Patient Characteristics

During the intervention period, 269 patients 60 years or older were admitted to the hospital, of whom, 58 were referred to the KCTI program. The age of the study population ranged from 60 to 105 years, with the mean being 78 years. Slightly more than half (51%) of the sample were male. Eighty-nine percent of the patients received medical services, with another 9% receiving intensive care services and 2% receiving surgery or emergency services. Health insurance status included 41% of patients insured by Medicare, 23% insured by HMSA/65C+, and 11% insured by HMSA itself, with the rest of patients insured by 23 other insurance plans (Table 1).

Comparing patient characteristics between baseline and intervention period found no significant difference in the distribution of patients' sex; discharge site; percentage of patients with arrhythmias, cellulitis, or COPD; mean age; or mean length of stay (Table 1). Nevertheless, a significant difference was observed in patients' primary

Table 1. Comparison of Patient Characteristics Between the Intervention (April 1, 2012-March 31, 2013) and Baseline Periods (January 1, 2010-December 31, 2010)

Patient Characteristics Statistic	Intervention (n = 269)	Baseline (n = 288)	*P*
Male	49.1%	51.4%	.585
Discharging sites			.283
Home (with or without home health)	151 (56.1%)	145 (50.4%)	
Intermediate care facility/ Skilled nursing facility	90 (33.5%)	115 (39.9%)	
Other	28 (10.4%)	28 (9.7%)	
Primary diagnosis of arrhythmias	14 (5.2%)	14 (4.9%)	.853
Any diagnosis of cellulitis	10 (3.7%)	13 (4.5%)	.637
Any diagnosis of COPD	16 (6.0%)	13 (4.5%)	.445
Primary health insurance			.04
HMSA	30 (11.2%)	27 (9.4%)	
HMSA/65C Plus	63 (23.4%)	100 (34.7%)	
Medicare	110 (40.9%)	100 (34.7%)	
Other[a]	66 (24.5%)	61 (22.2%)	
Age, years ([Mean (SD)]	77.5 (11.3)	76.6 (10.4)	.323
Length of stay [Mean (SD)]	3.6 (2.6)	5.5(3.7)	.728

COPD indicates chronic obstructive pulmonary disease; HMSA, Hawaii Medical Service Association.
[a]Other types of insurance included Medicare Advantage plans such as Alohacare Advantage, Ohana/Wellcare Medicare Advantage Plan, Humana Medicare Advantage Plan, Medicare Advantage Plan, etc.

health insurance, with more patients insured with Medicare in the intervention period than in the baseline period (χ^2 = 8.592; *P* = .035) (Table 1).

Septicemia was the top primary diagnosis, constituting 18% of the study sample, followed by pneumonia (10%), chronic heart diseases (5%), chronic bronchitis (4%), and cellulitis (3%). Among the 269 patients, a total of 14 patients had arrhythmias as the primary diagnosis, and among any of the first 3 diagnoses, 10 patients had cellulitis and 16 patients had COPD.

Readmission Rates at the Intervention Period and Baseline Period

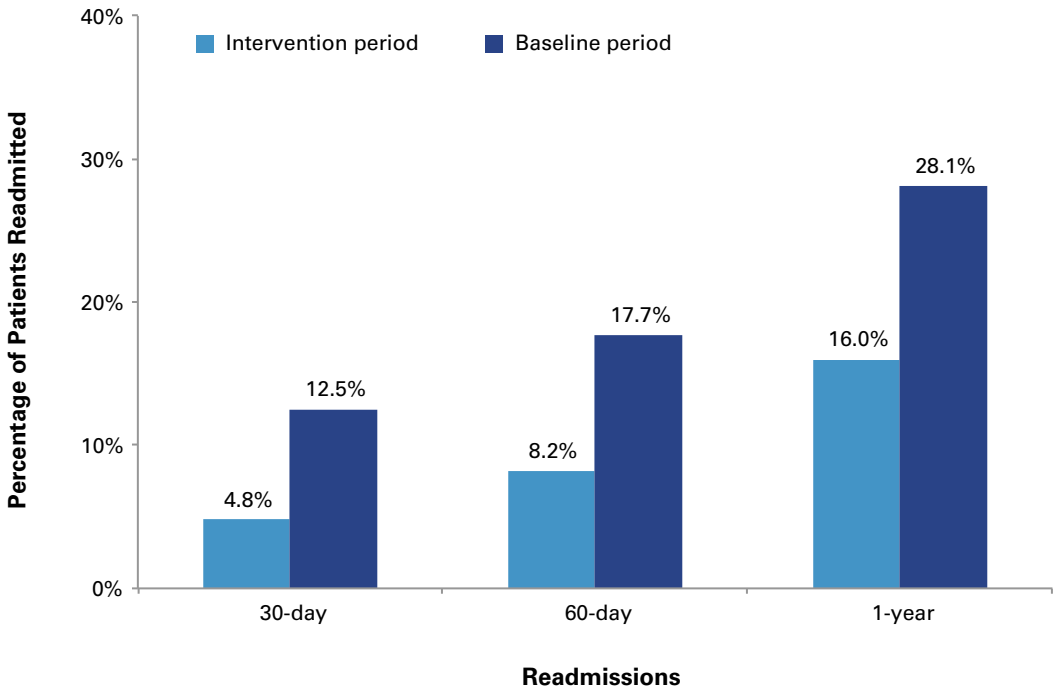
A significant difference was observed in the 30-day, 60-day, and 1-year readmission rates between the intervention and baseline periods. Compared with baseline (fiscal year 2010), the 30-day readmission rate was reduced by 61.4%—from 12.5% at baseline to 4.8% during the intervention period (χ^2 = 10.19; *P* = .001). The 60-day readmission rate was reduced by 53.6%—from 17.7% at baseline to 8.2% during the intervention period (χ^2 = 11.09; *P* <.001). The 1-year readmission rate was reduced by 42.8%, from 28.1% at baseline to 16.0% during the intervention period (χ^2 = 11.85; *P* <.001) (**Figure**).

Results from the Logistic Regression, Controlling for Patient Characteristics

Logistic regression revealed that the intervention significantly reduced the 30-day readmission rate, while controlling for patients' primary health insurance, discharging sites, arrhythmias as primary admitting diagnosis, and presence of COPD or cellulitis in the first 3 admitting diagnoses (**Table 2**). Readmission within 30 days during the intervention period was one-third as likely as during the baseline period (odds ratio [OR], 0.34; *P* = .003). Patients with arrhythmias (OR, 2.96; *P* = .04) as the primary diagnosis, or cellulitis among the first 3 admitting diagnoses (OR, 3.27; *P* = .03), were 3 times more likely to be readmitted within 30-day period, compared with patients without such conditions. Neither patients' discharge site nor primary insurance was a significant predictor for 30-day readmission.

Similar results were found in predicting the 60-day readmission rate. Readmission within 60 days during the intervention period was less than half as likely as during the baseline period (OR, 0.42; *P* <.01). Patients with arrhythmias as the primary diagnosis (OR, 2.93; *P* = .03) and patients with cellulitis among the first 3 admitting diagnoses (OR = 2.68; *P* = .03) were 3 times more likely to be readmitted within a 60-day period. Neither patients' discharge site nor pri-

Figure. Comparing Readmission Rates Between the Intervention (April 1, 2012-March 31, 2013) and Baseline Periods (January 1, 2010-December 31, 2010)



mary insurance was a significant predictor for 60-day readmission.

Readmission within a year was also significantly reduced by the intervention. During the intervention period, the 1-year readmission rate was only half of that during the baseline period (OR, 0.48; P <.001). Arrhythmias as the primary diagnosis and cellulitis among the first 3 admitting diagnoses were no longer significant predictors; however, COPD among the first 3 admitting diagnoses emerged as a significant predictor of readmission within a year (OR, 3.20; P <.01). Patients with COPD among the first 3 admitting diagnoses were 3 times more likely to be readmitted than patients without this condition.

Among the 58 patients referred to KCTI, 31 completed the Patient Activation Assessment (PAA), 48 completed the Overall Quality of Care Transition Score, and 16 completed the CTI 30-day follow-up survey. The PAA found that the KCTI program succeeded in improving patients' medication management ability, healthcare follow-up, and the use of PHR. The overall quality of care transition was high, with mean scores of 3.4 to 3.5 out of a possible 4. The CTI 30-day follow-up survey revealed that the majority of the patients improved in their understanding and skills in medication management and in recognizing signs of worsening health conditions.

DISCUSSION

A recent systematic review found that published studies of transitional care interventions do not often include, in their randomized controlled trials, the older patients at highest risk of rehospitalization.[23] A Web-based survey to examine hospitals' use of specific practices to reduce readmissions reported that fewer than half of hospitals had partnered with community physicians, and fewer than a quarter had partnered with local hospitals to manage patients at high risk for readmission.[24] Those might be among the reasons why some interventions worked, but others did not.

This study identified multiple diagnoses as risk factors of readmission at baseline to be targeted for the intervention—a unique approach compared with most studies in which a single diagnostic group was identified and targeted.[5,9,12] Patient education and empowerment were other signature components of the KCTI program. KCTI referred patients to an array of home- and community-based programs that might further assist patients' care at home. Such practices are in accordance with the literature, which advocates for integrated, coordinated, or guided care to address transitional care in older adults.[25,26]

This study was able to reduce readmission rates in a facility with a relatively low rate of readmissions to start

(eg, a 12.5% 30-day readmission rate at baseline, compared with an average of 20% in the literature).[1-3] Several mechanisms might explain the success of the KCTI program and the sustained effect of a 30-day intervention at 60 days and 1 year. First, re-referrals of patients readmitted within 30 days back to the KCTI program might have prevented potential 60-day or 1-year readmissions. Secondly, a historically strong working relationship between KAEA and the hospital helped to secure the executive leadership support and front-line staff buy-in to implement the intervention. Finally, as Kauai's area agency on aging and the county's designated aging and disability resource center—the 1-stop-shop for long-term care information and resources—KAEA can assess, counsel, and link individuals to other community services that will continue to help keep the patient safe and healthy at home. KAEA serves as a safety net for the frail, vulnerable elders who now have a vital community resource that they can turn to for additional services and information as their needs change.

Table 2. Results of the Logistic Regression Analysis Predicting 30-Day Readmission Rate, Controlling for Selected Patient Characteristics

Variable	B	SE	*P*	OR	95% CI
Time (intervention period)	–0.52	0.17	<.01	0.36	0.18-0.70
Primary insurance					
HMSA	–0.74	0.56	.19	0.41	0.09-1.92
Medicare	0.17	0.28	.54	1.02	0.49-2.90
Other[a]	0.41	0.30	.17	1.25	0.44-3.52
Discharge sites					
ICF or SNF	0.15	0.24	.52	1.41	0.74-2.68
Other	0.04	0.34	.92	1.25	0.44-3.52
Arrhythmias	1.09	0.55	.047	2.96	1.02-8.65
Any COPD	–0.03	0.77	.97	0.98	0.22-4.38
Any cellulitis	1.19	0.55	.03	3.27	1.12-9.59

B indicates regression coefficient; COPD, chronic obstructive pulmonary disease; HMSA, Hawaii Medical Service Association; ICF, intermediate care facility; OR, odds ratio; SE, standard error; SNF, skilled nursing facility.
[a]Other types of insurance included Medicare Advantage plans, such as AlohaCare Advantage, Ohana/ Wellcare Medicare Advantage Plan, etc.

Limitations

One study limitation is that there was no randomization at the patient level, and subsequently, there was no equivalent comparison or control group for the study, which is a threat to internal validity. This was mitigated, however, by the evaluation of patient characteristics between baseline and intervention period. The findings revealed that patient characteristics remained the same among most of the identified risk factors, such as percent of patients discharged to a location other than their homes and percent of patients with certain admitting diagnoses (eg, cellulitis, COPD, arrhythmias). The only difference identified was the distribution of various types of health insurance among the hospital patient population, with a slightly higher percentage of Medicare patients (40.9%), but a slightly lower percentage of HMSA/65C Plus patients (23.4%) during the intervention period compared with baseline (ie, 34.7% for Medicare and 34.7% for HMSA/65C Plus patients, respectively). Nevertheless, this fact actually reflected the strength of the study because more patients with fee-for-serve Medicare during the intervention would conceivably bias the findings toward the null hypothesis. In addition, the effectiveness of the intervention remained true even after controlling for patient's primary health insurance in the logistic regression. Patient's primary insurance was not found to be a significant predictor for hospital readmission.

CONCLUSIONS

Overall, this study demonstrates that a patient-centered intervention designed to address readmission rates can be successfully implemented in a small acute hospital setting and can indeed reduce readmissions. The KCTI interventions that were successfully provided to patients with identified risk factors—educating and empowering patients with better skills in managing their own health, and referring patients to home- and community-based programs that might assist their care at home—are worthy of further investigation and replication.

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REFERENCES

1. Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-service program. *N Engl J Med.* 2009;360(14):1418-1428.

2. Anderson GF, Steinberg EP. Hospital readmissions in the Medicare population. *N Engl J Med.* 1984;311(21):1349-1353.

3. Joynt KE, Jha AK. Thirty-day readmissions—truth and consequences. *N Engl J Med.* 2012;366(15):1366-1369.

4. Elixhauser A, Steiner C. Readmissions to U.S. hospitals by diagnosis, 2010 [statistical brief No. 153]. Healthcare Cost and Utilization Project website. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb153.pdf. Published April 2013. Accessed September 8, 2014.

5. Dharmarajan K, Hsieh AF, Lin Z, et al. Diagnoses and timing of 30-day readmissions after hospitalization for heart failure, acute myocardial infarction, or pneumonia. *JAMA.* 2013;309(4):355-363.

6. Gruneir A, Dhalla IA, van Walraven C, et al. Unplanned readmissions after hospital discharge among patients identified as being at high risk for readmission using a validated predictive algorithm. *Open Med.* 2011;5(2):e104-e111.

7. Kansagara D, Englander H, Salanitro A, et al. Risk prediction models for hospital readmission: a systematic review. *JAMA.* 2011;306(15):1688-1698.

8. Holloway JJ, Thomas JW, Shapiro L. Clinical and sociodemographic risk factors for readmission of Medicare beneficiaries. *Health Care Financ Rev.* 1988;10(1):27-36.

9. Marcantonio ER, McKean S, Goldfinger M, Kleefield S, Yurkofsky M, Brennan TA. Factors associated with unplanned hospital readmission among patients 65 years of age and older in a Medicare managed care plan. *Am J Med.* 1999;107(1):13-17.

10. Arbaje AI, Wolff JL, Yu Q, Powe NR, Anderson GF, Boult C. Postdischarge environmental and socioeconomic factors and the likelihood of early hospital readmission among community-dwelling Medicare beneficiaries. *Gerontologist.* 2008;48(4):495-504.

11. Robinson S, Howie-Esquivel J, Vlahov D. Readmission risk factors after hospital discharge among the elderly. *Popul Health Manag.* 2012;15(6):338-351.

12. Hersh AM, Masoudi FA, Allen LA. Postdischarge environment following heart failure hospitalization: expanding the view of hospital readmission. *J Am Heart Assoc.* 2013;2(2):e000116.

13. Benbassat J, Taragin MI. The effect of clinical interventions on hospital readmissions: a meta-review of published meta-analyses. *Isr J Health Policy Res.* 2013;2(1):1.

14. Costantino ME, Frey B, Hall B, Painter P. The influence of a postdischarge intervention on reducing hospital readmissions in a Medicare population. *Popul Health Manag.* 2013;16(5):310-316.

15. Coleman EA, Parry C, Chalmers S, Min SJ. The care transitions intervention: results of a randomized controlled trial. *Arch Intern Med.* 2006;166(17):1822-1828.

16. Voss R, Gardner R, Baier R, Butterfield K, Lehrman S, Gravenstein S. The care transitions intervention: translating from efficacy to effectiveness. *Arch Intern Med.* 2011;171(14):1232-1237.

17. McGaw J, Conner DA, Delate TM, Chester EA, Barnes CA. A multidisciplinary approach to transition care: a patient safety innovation study. *Perm J.* 2007;11(4):4-9.

18. Courtney M, Edwards H, Chang A, Parker A, Finlayson K, Hamilton K. Fewer emergency readmissions and better quality of life for older adults at risk of hospital readmission: a randomized controlled trial to determine the effectiveness of a 24-week exercise and telephone follow-up program. *J Am Geriatr Soc.* 2009;57(3):395-402.

19. Witherington EM, Pirzada OM, Avery AJ. Communication gaps and readmissions to hospital for patients aged 75 years and older: observational study. *Qual Saf Health Care.* 2008;17(1):71-75.

20. Coleman EA, Smith JD, Frank JC, Min SJ, Parry C, Kramer AM. Preparing patients and caregivers to participate in care delivered across settings: the Care Transitions Intervention. *J Am Geriatr Soc.* 2004;52(11):1817-1825.

21. Bal DG, Clark K. Kauai's community health needs assessment: our keiki, our kupuna, our 'ohana. State of Hawaii, Department of Health: Kauai District Health Office website. http://health.hawaii.gov/kauai/files/2013/07/KAUAI-CHNA-July-2013.pdf. Published July 2013. Accessed October 10, 2014.

22. Coleman EA. Care Transitions measures specifications. Care Transitions website. http://www.caretransitions.org/documents/CTM-3Specs0807.pdf. Accessed January 26, 2015.

23. Piraino E, Heckman G, Glenny C, Stolee P. Transitional care programs: who is left behind? a systematic review. *Int J Integr Care.* 2012;12:e132-e140.

24. Bradley EH, Curry L, Horwitz LI et al. Contemporary evidence about hospital strategies for reducing 30-day readmissions: a national study. *J Am Coll Cardiol.* 2012;60(7):607-614.

25. Golden AG, Ortiz J, Wan TT. Transitional care: looking for the right shoes to fit older adult patients. *Care Manag J.* 2013;14(2):78-83.

26. Shu CC, Hsu NC, Lin YF, Wang JY, Lin JW, Ko WJ. Integrated postdischarge transitional care in a hospitalist system to improve discharge outcome: an experimental study. *BMC Med.* 2011;9:96. ■

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