National Survey of Hospital Strategies to Reduce Heart Failure Readmissions

Findings From the Get With the Guidelines-Heart Failure Registry

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Background—Reducing 30-day heart failure readmission rates is a national priority. Yet, little is known about how hospitals address the problem and whether hospital-based processes of care are associated with reductions in readmission rates.

Methods and Results—We surveyed 100 randomly selected hospitals participating in the Get With the Guidelines-Heart Failure quality improvement program regarding common processes of care aimed at reducing readmissions. We grouped processes into 3 domains (ie, inpatient care, discharge and transitional care, and general quality improvement) and scored hospitals on the basis of survey responses using processes selected a priori. We used linear regression to examine associations between these domain scores and 30-day risk-standardized readmission rates. Of the 100 participating sites, 28% were academic centers and 64% were community hospitals. The median readmission rate among participating sites (24.0%; 95% CI, 22.6%–25.7%) was comparable with the national average (24.6%; 23.5–25.9). Sites varied substantially in care processes used for inpatient care, education, discharge process, care transitions, and quality improvement. Overall, neither inpatient care nor general quality improvement domains were associated with 30-day readmission rates. Hospitals in the lowest readmission rate quartile had modestly higher discharge and transitional care domain scores (P=0.03).

Conclusions—A variety of strategies are used by hospitals in an attempt to improve 30-day readmission rates for patients hospitalized with heart failure. Although more complete discharge and transitional care processes may be modestly associated with lower 30-day readmission rates, most current strategies are not associated with lower readmission rates. **(*Circ Heart Fail*. 2012;5:680-687.)**

Key Words: heart failure ■ outcomes ■ registries

Preventing readmission after a heart failure hospitalization is a focus of national quality improvement efforts.[1] Up to 20% of patients hospitalized with heart failure are readmitted within 30 days.[2–4] These numbers may be higher in some geographic areas and vary by state and even locality.[5] Hospital readmission is costly and is usually considered to be preventable.[4] Efforts to reduce readmissions after heart failure hospitalizations have been largely unsuccessful, and national data show no evidence that readmission rates have fallen during the past 2 decades,[3] despite the observation that heart failure hospitalizations in the United States have declined almost 30% during the past decade.[6] Understanding the drivers of unplanned readmission has become increasingly important, yet effective interventions remain elusive.

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Several processes of care have the potential to reduce heart failure readmission rates. These processes include comprehensive inpatient education, medication reconciliation, outpatient nursing support, disease management, and improved communication between inpatient and outpatient physicians. However, data are limited regarding which, if any, processes of care are effective.[2,7–9] Although large quality improvement initiatives are underway to improve readmission rates, little is known about processes of care currently used by hospitals and the associations between their use and readmission rates.

To investigate hospital-based approaches to reduce heart failure readmissions, we administered a telephone survey to personnel at 100 randomly selected hospitals participating

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in the Get With the Guidelines-Heart Failure (GWTG-HF) quality improvement initiative. The aims of the study were to describe hospital-based approaches to reduce heart failure readmissions and to explore associations between those approaches and risk-standardized readmission rates.

Methods

Data Sources

We used a telephone survey developed for this study and administered the survey to personnel at randomly selected hospitals participating in the GWTG-HF quality improvement initiative. The GWTG-HF registry is a voluntary quality improvement initiative sponsored by the American Heart Association. The GWTG-HF registry is a continuation of the Organized Program to Initiate Life-Saving Treatment in Hospitalized Patients With Heart Failure (OPTIMIZE-HF). Both registries had the same design, inclusion criteria, and data collection methods.[10] Patients were eligible for inclusion in the registry if they were admitted to a hospital for an episode of worsening heart failure or developed significant heart failure symptoms during a hospitalization for which heart failure was the primary discharge diagnosis. Participating institutions submitted data on consecutive eligible patients in compliance with Joint Commission and Centers for Medicare & Medicaid Services standards. The registry included hospitals from all regions of the United States, ranging in type from community hospitals to academic tertiary care referral centers. The validity and generalizability of the GWTG-HF registry have been described previously.[11]

We linked each responding GWTG-HF hospital with its Medicare provider number using a method described previously.[12] The Medicare provider number was used to extract information from the Hospital Compare Outcomes of Care database[13] and from the American Hospital Association Annual Survey database. Using methods developed for the Centers for Medicare & Medicaid Services and endorsed by the National Quality Forum,[14] the Hospital Compare database reports risk-standardized outcomes of acute care hospitals for several patient populations. The version of the database used for analysis covered hospitalizations between 2005 and 2008. The American Hospital Association Annual Survey[15] contains information on hospital characteristics and services available. Some information is self-reported and, therefore, was not available for nonresponding hospitals.

Readmission Measure

The primary measure of readmission was the hospital risk-standardized 30-day readmission rate for Medicare fee-for-service beneficiaries who were hospitalized with a principal diagnosis of heart failure and discharged alive to a nonacute care setting, as reported in the Hospital Compare Outcomes of Care database. The risk-standardization models are based on administrative data and adjusted for patient-specific age, sex, and condition categories, derived from hierarchical condition categories, including 9 characteristics from the cardiovascular medical history and 26 other comorbid conditions. More detail about the model is available in the Hospital Compare Web site.[13,14]

Hospital Characteristics

Hospital survey respondents were described according to various characteristics. From the Hospital Compare Outcomes of Care database, we used the annual number of heart failure hospitalizations. Information about the number of hospital beds, Council of Teaching Hospitals membership, and cardiology services available at the hospital was obtained from the 2008 American Hospital Association Annual Survey. Cardiology services of interest included heart transplant, adult cardiac surgery, cardiac intensive care, and adult interventional cardiac catheterization.

Survey Development

We developed the survey using a rigorous peer-review protocol. Before survey development, the investigators explored potential care process variables by convening a semistructured focus group, with 3 sites identified as leading performers on the basis of 30-day readmission data among GWTG-HF participating centers. After focus group discussions, the investigators drafted and circulated a survey among 8 providers representing clinicians, clinical investigators, outcomes researchers, and nursing experts involved in heart failure care, with experience as local quality champions. We further refined the survey and piloted it with representatives from quality-of-care organizations, hospital administrators, and local quality officers to ensure that the questions were easily interpretable with reproducible answers.

Survey Administration

All sites participating in GWTG-HF were informed of the study by e-mail and given the opportunity to refuse, in which case they were removed from the list of potential sites. Eligible sites were hospitals that had submitted ≥40 heart failure admissions to GWTG-HF. We used this criterion on the premise that these hospitals were actively engaged in local quality improvement efforts specific to heart failure. We randomly selected 100 hospitals for survey administration.

Trained interviewers administered the telephone survey between March and October 2010 to site personnel identified by the GWTG institutional contact (ie, site coordinator or physician) as best able to answer questions about institutional processes of care for patients with heart failure. Participants included heart failure nurse coordinators, nurse administrators, midlevel providers, and physicians. We identified the hospitals using only a unique site identifier and did not record the name of the respondent. Because of the survey structure, responses were recorded onto a paper form and then entered into a computerized database. A heart failure nurse, a physician, and a qualitative research expert each reviewed all free-text responses and coded them into discrete categories before statistical analysis.

Defining Domains of Care Processes

We hypothesized that 3 domains would be associated with readmission: inpatient care, discharge and transitional care, and general quality improvement. Questions relevant to each domain were selected a priori by a heart failure physician investigator and reviewed by 2 other physician investigators before being finalized (Table 1). We scored each hospital within these domains using their responses to multiple survey questions. The score reflected the total number of positive responses in each domain, as well as an overall score reflecting the total number of positive responses across all domains.

Statistical Analysis

For descriptive purposes, we placed hospitals into quartiles based on their risk-standardized readmission rates. We present hospital characteristics by readmission quartile, using means with SDs for continuous variables and frequencies with percentages for categorical variables. We assessed associations between quartiles and all variables using Cochran-Mantel-Haenszel nonzero correlation tests. We present scores in each domain overall and by readmission quartile. We assessed associations between domain scores and readmission quartiles using Cochran-Mantel-Haenszel nonzero correlation tests. In a parallel analysis, we tested for associations between domain scores and continuous risk-standardized readmission rate.

Results

All the 100 randomly selected hospitals completed the survey. According to self-report, 28% of the hospitals were in academic medical centers, 64% were community hospitals, 3% were private tertiary centers, and 5% were other hospital types. The

Table 1. Adherence to Algorithmic Domain Items Overall and by Quartile of Risk-Standardized Readmission Rate

Domain Items	Overall (N=100)	Risk-Standardized Readmission Rate				*P* Value*
		Quartile 1 (n=25)	Quartile 2 (n=25)	Quartile 3 (n=25)	Quartile 4 (n=25)	
Domain 1: Inpatient care/inpatient education, n (%)						
Offers inpatient education	90 (90)	21 (84)	24 (96)	23 (92)	22 (88)	0.77
Inpatient education includes nutrition, sign and symptom recognition, and medication	89 (89)	21 (84)	23 (92)	23 (92)	22 (88)	0.67
Inpatient education includes written materials/books and videos	87 (87)	21 (84)	23 (92)	21 (84)	22 (88)	0.90
At least 1 type of reminder to inpatient providers to initiate evidence-based therapies	100 (100)	25 (100)	25 (100)	25 (100)	25 (100)	>0.99
Reminders to initiate evidence-based therapy use, computerized pop-ups/ticklers, quality assurance chart review, and pharmacist chart review	98 (98)	23 (92)	25 (100)	25 (100)	25 (100)	0.06
Admits all patients to specialized heart failure unit	3 (3)	0 (0)	1 (4)	2 (8)	0 (0)	0.79
Pharmacist and dietician participate on care team	71 (71)	18 (72)	20 (80)	17 (68)	16 (64)	0.38
Domain 2: Discharge processes/transitional care, n (%)						
At least 1 mechanism used to remind providers to discharge patients home on evidence-based therapies	94 (94)	25 (100)	22 (88)	23 (92)	24 (96)	0.71
Uses a computerized mechanism to remind providers to discharge patients home on evidence-based therapies	31 (31)	10 (40)	6 (24)	5 (20)	10 (40)	0.92
Offers day-of-discharge education	91 (91)	23 (92)	22 (88)	23 (92)	23 (92)	0.88
Discharge materials include written information, medication schedules, and medication information	100(100)	25 (100)	25 (100)	25 (100)	25 (100)	>0.99
Provides weight scale at discharge	25 (25)	7 (28)	10 (40)	3 (12)	5 (20)	0.18
Offers referral to disease management program	42 (42)	11 (44)	9 (36)	11 (44)	11 (44)	0.86
Patient's primary outpatient providers are notified about hospital admission sometimes, often, or always	93 (93)	25 (100)	22 (88)	24 (96)	22 (88)	0.22
Patient's primary outpatient providers are notified about hospital admission always	52 (52)	18 (72)	9 (36)	13 (52)	12 (48)	0.21
Follow-up outpatient appointments are scheduled for patients sometimes, often, or always	76 (76)	21 (84)	19 (76)	17 (68)	19 (76)	0.41
Follow-up outpatient appointments are scheduled for patients always	28 (28)	11 (44)	7 (28)	4 (16)	6 (24)	0.07
Site-preferred timing of initial outpatient follow-up within 14 days of discharge	93 (93)	23 (92)	23 (92)	25 (100)	22 (88)	0.86
Prescriptions at time of discharge delivered to patient or transmitted to pharmacy electronically	27 (27)	9 (36)	9 (36)	5 (20)	4 (16)	0.067
Domain 3: Quality improvement, n (%)						
At least 1 kind of provider receives quality improvement feedback	100 (100)	25 (100)	25 (100)	25 (100)	25 (100)	>0.99
Dedicated quality improvement specialist or nurse coordinator disseminates quality improvement feedback	92 (92)	22 (88)	24 (96)	22 (88)	24 (96)	0.51
Providers are at least a little responsive to quality improvement feedback	100 (100)	25 (100)	25 (100)	25 (100)	25 (100)	>0.99
Providers are very responsive to quality improvement feedback	31 (31)	8 (32)	7 (28)	9 (36)	7 (28)	0.92
Executives are at least somewhat committed to quality improvement	98 (98)	24 (96)	25 (100)	24 (96)	25 (100)	0.54
Executives are very committed to quality improvement	88 (88)	22 (88)	21 (84)	22 (88)	23 (92)	0.58
There are regularly scheduled heart failure or cardiology quality improvement meetings	83 (83)	21 (84)	19 (76)	22 (88)	21 (84)	0.72
There are weekly or biweekly heart failure quality improvement meetings	4 (4)	0 (0)	1 (4)	2 (8)	1 (4)	0.36
Hospital has targeted specific aspects of care to reduce unplanned readmissions	79 (79)	17 (68)	17 (68)	23 (92)	22 (88)	0.02
Hospital has established quantifiable performance targets to reduce unplanned readmissions	65 (65)	17 (68)	11 (44)	19 (76)	18 (72)	0.31

*From Cochran-Mantel-Haenszel nonzero correlation test.

hospitals reported a mean of 572 heart failure admissions per year. Respondents primarily identified themselves as quality assurance or quality improvement managers (38%) and registered nurses or case managers (26%). Interviews with midlevel providers (14%) and physicians (6%) were less common.

The overall 30-day mean risk-standardized readmission rate was 24.2% (SD, 2.4). Mean readmission rates by quartile, from lowest to highest quartile, were 21.3% (1.1), 23.4% (0.4), 24.8% (0.5), and 27.2% (1.5). Table 2 shows hospital characteristics stratified by quartile of 30-day readmission rate. The hospitals varied in size and had a mean size of 360 beds. Although hospitals in the quartile with the highest readmission rates had more beds, differences between the quartiles were not statistically significant. A higher proportion of

Table 2. Hospital Characteristics by Quartile of Risk-Standardized Readmission Rate

Characteristic	Overall (N=100)	Risk-Standardized Readmission Rate				*P* Value*
		Quartile 1 (n=25)	Quartile 2 (n=25)	Quartile 3 (n=25)	Quartile 4 (n=25)	
Hospital compare data						
Annual heart failure admissions, mean (SD)	572.0 (327.8)	533.4 (255.0)	464.8 (332.7)	607.8 (242.7)	682.2 (425.6)	0.07
Risk-standardized 30-day readmission rate, mean (SD)	24.2 (2.4)	21.3 (1.1)	23.4 (0.4)	24.8 (0.5)	27.2 (1.5)	<0.001
Risk-standardized 30-day mortality rate, mean (SD)	11.1 (1.7)	11.8 (1.6)	11.1 (1.7)	10.8 (1.7)	10.7 (1.5)	0.012
American Hospital Association survey data						
Hospitals identified in data, n†	97	25	25	24	23	
Hospital beds, mean (SD)	360 (235)	323 (138)	330 (278)	343 (182)	452 (301)	0.18
Council of Teaching Hospitals member, n (%)	23 (24)	3 (12)	5 (20)	5 (21)	10 (43)	0.02
No. of hospitals with information on services	91	24	23	22	22	
Cardiology services, n (%)						
Adult cardiac surgery	57 (63)	18 (75)	12 (52)	13 (59)	14 (64)	0.53
Adult interventional cardiac catheterization	69 (76)	22 (92)	14 (61)	16 (73)	17 (77)	0.40
Cardiac intensive care	63 (69)	18 (75)	16 (70)	14 (64)	15 (68)	0.54
Heart transplant	14 (15)	3 (13)	3 (13)	5 (23)	3 (14)	0.69

*From Cochran-Mantel-Haenszel nonzero correlation test.

†Not all hospitals in the Get With the Guidelines-Heart Failure registry were identifiable or had complete information in the American Hospital Association survey.

teaching hospitals were in quartiles with higher readmission rates (*P*=0.02). Among participating hospitals, 57 (63%) had on-site cardiac surgical services and 63 (69%) had intensive cardiac care services. Interventional cardiac catheterization was available at 69 hospitals (76%).

Inpatient Care and Education

A majority of hospitals (84%) reported that dedicated hospitalists cared for some patients admitted with heart failure (online-only Data Supplement Table I). A large proportion of hospitals used private general medicine services (69%) and private cardiology services (64%). A minority (31%) used specialized heart failure care units. However, a majority of sites reported that physicians and nurses were part of a multidisciplinary heart failure care team that included dieticians (87%), pharmacists (76%), physical therapists (63%), and social workers (74%). Computerized technology for such processes as standardized order writing or reminders to initiate evidence-based therapies was used inconsistently.

Inpatient education included information about medications and the need for medication adherence (99%), recognition of heart failure signs and symptoms (96%), and nutrition (94%). Sixty percent of hospitals offered televised video education, and 94% distributed written materials or books. The bedside nurse (94%), dietician (78%), midlevel provider (54%), or physician (50%) administered inpatient heart failure education at the majority of hospitals. Less commonly, a dedicated nurse educator performed these duties (27%).

Discharge Processes and Care Transitions

Almost all hospitals (91%) provided education on the day of discharge. Educational content included medication instructions (35%), general discharge instructions (43%), and, less commonly, recognition of heart failure signs and symptoms (20%) (online-only Data Supplement Table II). Most hospitals (93%) reported that bedside nurses administered education on the day of discharge; at 54% of sites, preprinted material other than medication and general instructions was used. Less commonly, sites reported that a physician (34%) or midlevel provider (34%) administered at least some of the discharge education.

Computerized discharge instructions or pop-up reminders to prescribe evidence-based therapies were used by 24% and 18% of hospitals, respectively. Among the sites surveyed, 42% offered referral to heart failure disease management programs administered by the hospital (55%) or a cardiology practice (48%).

Nearly all hospitals (94%) preferred that patients be seen by a provider within 14 days of discharge. However, in nearly one quarter of hospitals, follow-up appointments were rarely or never scheduled for patients before discharge. Among hospitals scheduling follow-up appointments, most arranged for patients to see their primary care provider (93%) and cardiologist (80%). Similarly, most hospitals (89%) informed the patient's primary provider about the hospitalization. Few hospitals mandated that outpatient providers be informed about the patient's hospitalization within a defined period.

General Quality Improvement

A majority of hospitals had regular quality improvement meetings (83%) and dedicated specialists (87%) to disseminate quality improvement materials (online-only Data Supplement Table III). Processes for quality improvement and review varied widely across institutions; they included chart review, committee meetings, core measure reporting, patient surveys, and provider/nursing feedback. Hospitals routinely disseminated quality improvement feedback to cardiologists providing heart failure care (94%) and to hospitalists providing heart failure care (81%), nursing management (91%), and midlevel providers (73%).

Table 3. Domain Scores by Quartile of Risk-Standardized Readmission Rate

Domain Items Answered Favorably (No. of Items)	Overall (N=100)	Risk-Standardized Readmission Rate				*P* Value*
		Quartile 1 (n=25)	Quartile 2 (n=25)	Quartile 3 (n=25)	Quartile 4 (n=25)	
Domain 1: Inpatient care/inpatient education (7), mean (SD)	5.5 (0.8)	5.3 (0.9)	5.7 (0.7)	5.6 (0.7)	5.4 (0.9)	0.62
Domain 2: Discharge processes/transitional care (12), mean (SD)	7.5 (1.6)	8.3 (1.7)	7.3 (1.7)	7.1 (1.5)	7.3 (1.4)	0.03
Domain 3: Quality improvement (10), mean (SD)	7.4 (1.3)	7.2 (1.5)	7.0 (1.4)	7.7 (1.1)	7.6 (1.0)	0.14
Total (29), mean (SD)	20.4 (2.5)	20.9 (2.8)	20.0 (2.0)	20.4 (1.9)	20.4 (2.3)	0.39

*From Cochran-Mantel-Haenszel nonzero correlation test.

Sites reported a wide array of interventions to reduce unplanned readmissions. These initiatives included improving discharge planning or outpatient follow-up (40%), improving inpatient education (35%), and focusing on patients known to be at high risk for readmission (16%). Although most hospitals expressed interest in reducing unplanned readmissions, 30% had not established a quantifiable performance target.

Performance and Readmission Rates

We derived the score used to grade sites in each domain from 7 items for inpatient care processes, 12 discharge processes and care transition items, and 12 items regarding general quality improvement. Table 2 shows the responses to the domain items overall and by 30-day readmission rate quartile. Hospitals reported high levels of adherence to several items within each domain across all quartiles of readmission rate. Table 3 and the Figure report associations between the number of positive responses in the domains (ie, the domain scores) and the overall 30-day readmission rates. The mean continuous score in the inpatient care processes and education domain was 5.5 (SD, 0.8) out of a possible score of 7. There was no association between the mean item continuous score and readmission rate (P=0.63). Of the 12 items in the discharge processes and care transition domain, the mean item continuous score was 7.5 (1.6). There was a significant association between mean continuous score in the discharge processes and care transition domain and 30-day readmission rate (P=0.03). For domain 2, discharge processes and care transitions, and hospital characteristics stratified by domain score quartile were not significantly different, with the exception of 30-day readmission rate (online-only Data Supplement Table IV). In the general quality improvement domain, the mean item continuous score was 7.4 (SD, 1.3); there was no association between the domain continuous item score and 30-day readmission rate (P=0.14). Overall, 29 items were considered among the 3 domains of interest. The mean overall item score was 20.4 (SD, 2.5). There was no association between total item score and 30-day readmission rate (P=0.83).

Discussion

We used a telephone survey of a representative sample of hospitals in the GWTG-HF registry to explore associations between hospital-delivered processes of care for patients hospitalized with heart failure and short-term readmission rates. The first major finding was that hospitals varied significantly with respect to the processes of care they used, likely reflecting uncertainty about what works best to reduce readmission rates. We found no consistent associations between individual processes and short-term readmission rates. Among the 3 domains (ie, inpatient processes, discharge and transitional care processes, and general quality improvement), only processes in the discharge and transitional care domain had even a modest association with lower readmission rate.

Our study is among the first to nationally examine hospital processes aimed at improving short-term readmission rates among patients hospitalized with heart failure. We found that many processes were commonly used across hospitals, including inpatient and discharge education, use of hospitalists to care for patients with heart failure, participation of dieticians and pharmacists in delivering patient care, use of bedside nurses to administer heart failure education, commitment to early outpatient physician follow-up, and regular quality improvement meetings. However, among commonly used processes, it was difficult to detect a relationship with outcomes. Furthermore, marked site-level variation among care processes aimed at improving short-term outcomes among patients with heart failure suggests significant uncertainty as to which processes are most effective. The uncertainty likely stems from the lack of a firm evidence base from which to draw best practices.

Sites and their executive-level administrators appear to be committed to improving hospital performance with respect to short-term readmission. However, processes varied substantially by site. Administrative commitment likely reflects increasing pressure by government and other payers to reduce early readmission among patients with heart failure. The Centers for Medicare & Medicaid Services has begun publicly reporting hospital-level readmission rates for heart failure.[13] Furthermore, under a bundled payment program or pay-for-performance program, hospitals may be penalized for early readmissions.[16] Despite this apparent executive-level enthusiasm for implementing processes to reduce 30-day readmission rates, our results suggest a need for better evidence and resources dedicated to effectively achieve lower readmission rates.

In the inpatient care and discharge and transitional care domains, institutional uptake of computerized technology to remind providers to initiate evidence-based therapy varied, as did the content of inpatient educational materials. Bedside nurses administered most inpatient education. Institutional commitment to increasing bedside nurses' knowledge about

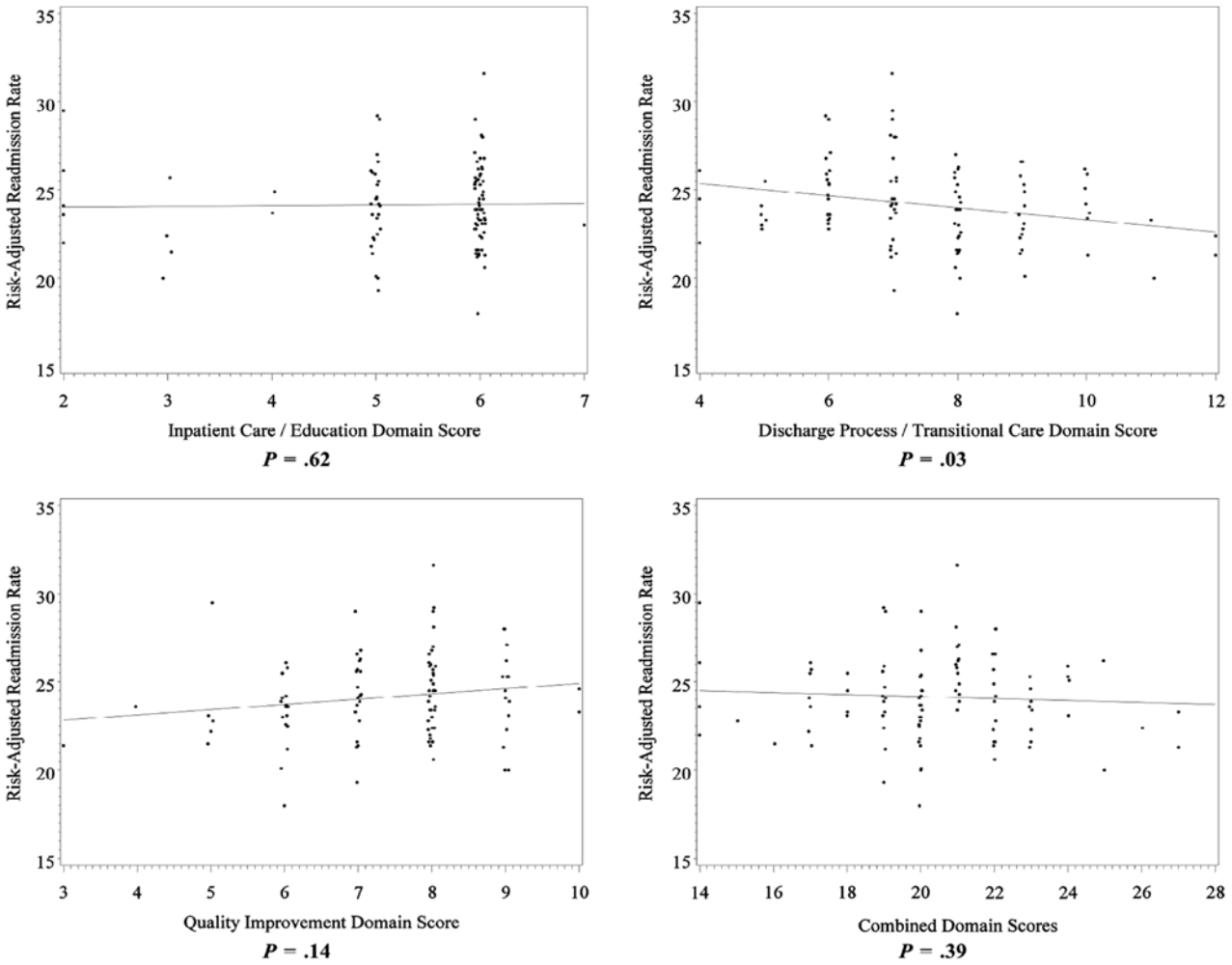

Figure. Relationships between domain scores and 30-day risk-standardized readmission rates.

heart failure education principles may be inadequate,[17] affecting optimal education delivery to patients. Focused research on the downstream benefits of heart failure–specific education of hospital bedside nurses may be important. Just over a quarter of sites used a dedicated heart failure nurse educator. Previous work has shown that, when a dedicated heart failure nurse educator delivered a 1-hour heart failure education program to patients before discharge, the 6-month hospital readmission rate was lower than among patients who received usual care education.[8] Our study did not examine the length of time spent educating individual patients before discharge, nor did we assess the consistency of patient education processes within sites. Given that bedside nurses have an important role in delivering heart failure education, standardized education delivery and adequate time to deliver effective education in busy inpatient settings may be important factors.

Similar to inpatient education, education on the day of discharge varied in content and was administered primarily by bedside nurses. Furthermore, the use of computerized reminders and discharge checklists to improve adherence to evidence-based therapies was used in <50% of the sites surveyed. Referral to disease management was offered by less than half of hospitals. Disease management can take many forms, including cardiology office visits, home care, telemonitoring, structured telephone calls, or bundling of multiple services. In several studies, the efficacy of disease management in reducing short-term readmissions was mixed.[18–20] Thus, definitive data regarding the effectiveness of different types of programs and bundled versus individual program services are needed.

Although hospital performance of inpatient care processes or general quality improvement processes was not associated with readmission, hospitals with lower readmission rates scored significantly higher in the discharge processes and care transition domain. Yet, the lack of a dose-response relationship and modest effect size calls into question the clinical meaningfulness of this relationship. In other transition care programs, services are multimodal and patient-centered and involve collaborative communication.[21] More research is needed to determine whether the depth and breadth of individual components are more important than having a multimodal focus or whether interventions that are patient-focused are the most meaningful in reducing readmissions.

Limitations

Our study has some limitations. Participating hospitals were participants in a national quality improvement initiative

and, therefore, may differ from other hospitals in the United States. Respondents answered questions on behalf of large, complex organizations. They may not have known the answers to each item or may have reported inaccurate information, which could limit the validity of the findings. Furthermore, we used readmission rates reported in a Hospital Compare database. The readmission rates include only Medicare fee-for-service beneficiaries, so our results may not be generalizable to patients enrolled in Medicare managed care or other programs. The readmission rates for heart failure reported by Hospital Compare are from 2005 through 2008. Our survey was administered in 2009 and 2010. Thus, there is a small temporal disconnect between survey responses and the associated hospital-level readmission rates. Furthermore, associations among individual process variables, domains, and readmission rates are limited by the relatively small sample size and limited variation in readmission rates across sites. Because of the multiple tests, some associations may represent a chance association, and validation in another sample may be warranted. Only 6% of respondents were physicians. However, we attempted to discern within each site the personnel most able to comment on overall care processes for patients with heart failure.

Conclusions

Hospitals' use of inpatient care processes, discharge processes, and quality improvement methodologies for patients hospitalized with heart failure varies widely. In this survey study, there were no statistically significant relationships between the use of individual processes of care and 30-day heart failure readmission rates. However, there was a modest association between more complete discharge and transitional care processes and lower 30-day readmission rates. More research is needed to identify processes that are clearly associated with improved short-term outcomes among patients hospitalized with heart failure.

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CLINICAL PERSPECTIVE

Reducing 30-day heart failure readmissions has become a national priority, yet which hospital-level processes of care might effectively accomplish this goal are unknown. To better understand those care processes currently being used by hospitals in the United States to lower 30-day readmission rates, the authors created a survey instrument administered to 100 randomly selected sites participating in the American Heart Association's Get With the Guidelines-Heart Failure quality improvement initiative. The survey explored care processes related to 3 domains: inpatient care, discharge and transitional care, and general quality improvement. Individual care processes and domain-level scores were described and tested to ascertain associations with hospital-level 30-day readmission rates. The authors found a wide variety of care processes used among various institutions. No individual care processes were reliably associated with reduced 30-day readmission rates. Among the 3 overall domains, only scores in the discharge and transitional care domain were modestly associated with 30-day readmission rates. The authors conclude that substantial variation in processes to reduce 30-day readmissions among hospitals reflects widespread uncertainty about how to achieve these goals. Whether increased attention to discharge and transitional care processes might result in reduced readmissions requires further study.