The Adoption and Spread of Hospital Care Coordination Activities Under Value-Based Programs

Larry R. Hearld, PhD; Nathaniel Carroll, PhD; and Allyson Hall, PhD

ABSTRACT

OBJECTIVES: To examine the relationship between participation in value-based programs and care coordination activities.

STUDY DESIGN: Cross-sectional, observational study of 1648 US hospitals using the American Hospital Association (AHA)'s 2013 Survey of Care Systems. Value-based program participation included participation in either an accountable care organization (ACO) or a bundled payment program. We assessed adoption (whether a hospital was using any of a set of 12 care coordination activities in the AHA survey) and spread (in each hospital adopting care coordination activities, how extensively those activities were implemented throughout the hospital).

METHODS: Ordinary least squares regression assessed associations between participation in an ACO or bundled payment program and the adoption and spread of 12 care coordination activities.

RESULTS: Hospitals adopted nearly two-thirds of the possible care coordination activities (mean [SD] = 7.9 [4.4] of 12). Among those hospitals adopting care coordination activities, there was a relatively moderate spread of these activities (mean = 2.5; range, 1 [minimally used] to 4 [used hospitalwide]). Hospital participation in an ACO was associated with the adoption of 3.07 more care coordination activities (P <.001), on average, and 0.16 more points on the scale of spread of care coordination activities (P <.001) compared with hospitals that were not participating in an ACO. Hospital participation in a bundled payment program was associated with the adoption of 1.84 more care coordination activities (b = 1.84; P <.001) but not greater spread (b = –0.04; P = .54).

CONCLUSIONS: Value-based programs such as ACOs appear to encourage the adoption and spread of care coordination activities by hospitals.

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Care coordination—defined as the deliberate organization of patient care activities between 2 or more participants (including the patient) involved in a patient's care to facilitate appropriate delivery of healthcare services[1]—is an essential component of high-quality, high-value care. For example, research has found that care coordination activities that help patients transition out of the hospital and back into the community are effective at avoiding undesirable outcomes, such as unnecessary readmissions.[2-4] However, research has also documented varying degrees of care coordination capabilities among providers,[5] highlighting an important opportunity for improving the quality of care.

Considerable emphasis in recent years has been placed on incentive programs such as accountable care organizations (ACOs) and bundled payments in the hopes that they will improve the value of healthcare in the United States. One means by which these programs may do so is by improving care coordination activities by healthcare providers, including and especially hospitals.[6-10] Research is beginning to emerge as to whether these programs are effective at promoting quality and lowering costs[11-15]; however, related but underresearched questions pertain to whether these programs are effective at promoting care coordination activities.[16] Answers to such questions are important for understanding reasons these programs may or may not be effective at promoting value in the US healthcare system.

Therefore, the purpose of this paper was to examine the adoption and spread of care coordination activities among US hospitals following the introduction of value-based payment programs. Further, the paper assesses the degree to which the adoption and spread of care coordination activities varies as a function of participation in these programs.

STUDY DATA AND METHODS

Data Sources

Bundled payment and Medicare ACO programs were launched by CMS in 2012.[17] We focused on 2013 to understand how well prepared early adopters of these programs were to coordinate

TAKEAWAY POINTS

- Overall, US hospitals adopted a relatively high number of care coordination activities (nearly two-thirds, on average, of those possible) but were less interested in or effective at spreading these activities throughout the hospital.
- Opportunities to improve the use of care coordination activities are not evenly distributed, with hospitals reporting extensive use of some activities and minimal use of others.
- Hospital participation in value-based programs, especially accountable care organizations, may provide a catalyst to adopt and spread care coordination activities.

care. Therefore, we consider our findings important in providing a baseline assessment of how hospitals may have responded to the incentives that these programs offer.

The data for this study were drawn from 3 sources: (1) the 2013 American Hospital Association (AHA) Annual Survey of Hospitals, (2) the 2013 AHA Survey of Care Systems, and (3) the Health Resources and Services Administration's 2013 Area Health Resource File (AHRF). The AHA Annual Survey of Hospitals is an annual electronic survey of approximately 6300 hospitals in the United States that provides extensive data regarding hospital organizational characteristics.[18] The AHA reports an 80% response rate to this survey each year. The Survey of Care Systems is a relatively new data collection effort by AHA, initiated in 2013, to monitor the evolution of new systems of care such as ACOs. The 2013 survey used in this analysis included 1648 hospitals, or approximately 34.4% of the general service acute care hospitals in the United States. The AHRF is a collection of data from different sources (eg, US Census Bureau, Bureau of Labor Statistics) that is used to construct the environmental characteristics considered in the study. The final analytic sample consisted of 1648 US acute care hospitals operating in 2013.

Dependent Variables

The analysis included 2 dependent variables related to hospital-initiated care coordination: adoption and spread. Adoption refers to the decision to use a new technology or process, whereas spread (also known as penetration or reach) pertains to the integration of that new technology or process within a setting.[19,20] In our study, the adoption of care coordination activities reflected how many different care coordination activities were reported as being used by a hospital. The AHA survey included questions that asked hospitals about whether they were engaging in 12 care coordination activities (**Table 1**). The use of each activity was measured on a 5-point scale ("not at all used," "used minimally," "used moderately," "used widely," or "used hospitalwide"). To construct our care coordination adoption variable, we first constructed a dichotomous indicator ("used" or "did not use") for each care coordination activity (0 if hospitals reported these activities were not at all used and 1 if hospitals reported they used these activities minimally, moderately, widely, or hospitalwide). Next, we summed these dichotomous indicators for each hospital (range, 0-12), with greater values indicating greater adoption of care coordination activities. As a sensitivity analysis, we estimated these relationships using a more conservative estimate of adoption (0 if hospitals reported not using these activities at all or using them minimally and 1 if hospitals reported using these activities moderately, widely, or hospitalwide). The results using this definition of adoption were similar to those reported here (results available from authors upon request).

Our second dependent variable—the spread of care coordination activities—reflected how extensively care coordination activities were implemented throughout a hospital. This variable was based on the same 12 care coordination items. In this case, we constructed the variable by quantifying the degree of spread for any of the 12 survey items for which a hospital indicated it had adopted the care coordination activity (range, 1 ["used minimally"] to 4 ["hospitalwide"]) and then averaging across the 12 items. We opted for this operationalization to make the adoption and spread processes more distinct and to reflect the fact that a hospital can spread only the care coordination activities that it has already adopted. An exploratory and confirmatory factor analysis of the care coordination activities indicated a single-factor solution and supported the decision to analyze these as a single composite.

Independent Variables

Our primary interest was in hospital participation in value-based programs, which we measured with 2 dichotomous variables. One variable reflected hospital membership in an ACO (1, yes; 0, no). The second variable reflected whether a hospital participated in a bundled payment program (1, yes; 0, no). Bundled payment programs included those sponsored by Medicare, as well as by commercial insurers.

The analysis also controlled for a number of hospital organizational characteristics that previous research has found to be associated with care coordination[21,22] and with participation in value-based programs,[23] as well as the physical, socioeconomic, and healthcare delivery system characteristics of the surrounding community. **Table 2** provides a list of these variables and how they were operationalized.

Analytic Strategy

The unit of analysis was the hospital. Univariate statistics were used to describe the sample hospitals, including their overall level of adoption and spread, as well as hospital adoption and spread for individual activities. Ordinary least squares (OLS) regression was used to assess the relationship between hospital participation in value-based programs and care coordination adoption and spread. We considered alternative functional forms for these models by estimating the relationships using a Poisson regression model. The relationships were consistent with our OLS regression models in terms of direction and statistical significance (results available from authors upon request). We also assessed whether the results differed when the ACO and bundled payment program participation

TABLE 1. Care Coordination Activities

Activity	Not Used at All n (%)	Used Minimally n (%)	Used Moderately n (%)	Used Widely n (%)	Used Hospitalwide n (%)	Adoption n (%)	Spread Mean (SD)
Chronic care management processes or programs to manage patients with high-volume, high-cost chronic diseases	178 (13.3)	333 (24.9)	449 (33.5)	214 (16.0)	165 (12.3)	1161 (86.7)	2.2 (1.0)
Use of predictive analytic tools to identify individual patients at high risk of poor outcomes or extraordinary resource use	406 (30.5)	337 (25.3)	333 (25.0)	149 (11.2)	106 (8.0)	925 (69.5)	2.0 (1.0)
Prospective management of patients at risk of poor outcomes or extraordinary resource use by experienced case managers	265 (20.0)	314 (23.6)	374 (28.2)	214 (16.1)	161 (12.1)	1063 (80.1)	2.2 (1.0)
Assignment of case managers to patients at risk of hospital admission or readmission for outpatient follow-up	276 (20.6)	294 (22.0)	293 (21.9)	252 (18.8)	223 (16.7)	1062 (79.4)	2.4 (1.1)
Medication reconciliation as part of an established plan of care	10 (0.8)	24 (1.8)	138 (10.3)	316 (23.6)	850 (63.5)	1328 (99.3)	3.5 (0.8)
Provision of visit summaries to patients as part of all outpatient encounters and scheduling of follow-up visit and/or specialty referrals at the time of the initial encounter	168 (12.7)	236 (17.8)	318 (24.0)	310 (23.4)	291 (22.0)	1323 (87.3)	2.6 (1.1)
Post–hospital discharge continuity of care program with scaled intensiveness based upon a severity or risk profile for adult patients in defined diagnostic categories or severity profiles	352 (26.6)	339 (25.6)	331 (25.0)	188 (14.2)	113 (8.5)	971 (73.4)	2.1 (1.0)
Arrangement of home visits by physicians, advanced practice nurses, or other professionals for homebound and complex patients for whom office visits constitute a physical hardship	415 (31.1)	327 (24.5)	242 (18.1)	188 (14.1)	164 (12.3)	921 (68.9)	2.2 (1.1)
Nurse case managers whose primary job is to improve the quality of outpatient care for patients with chronic diseases	377 (28.3)	357 (26.8)	278 (20.9)	187 (14.1)	132 (9.9)	954 (71.7)	2.1 (1.1)
Disease management programs for 1 or more chronic care conditions (eg, asthma, diabetes, chronic obstructive pulmonary disease)	251 (18.9)	312 (23.5)	384 (28.9)	219 (16.5)	164 (12.3)	1079 (81.1)	2.2 (1.0)
Hospitalists for medical/surgical inpatients	272 (20.3)	22 (1.6)	81 (6.0)	204 (15.2)	761 (56.8)	1068 (79.7)	3.6 (0.7)
Telephonic outreach to discharged patients within 72 hours of discharge	73 (5.5)	168 (12.6)	320 (24.0)	341 (25.6)	430 (32.3)	1259 (94.5)	2.8 (1.0)

variables were estimated in separate regression models. Once again, the relationships were consistent in terms of magnitude with the OLS models that simultaneously included both participation variables (results available from authors upon request).

RESULTS

Sample Descriptives

Slightly more than 18% of the sample hospitals were participating in an ACO compared with 8.9% participating in a bundled payment program (**Table 3**). The ACO participation rate is comparable with other estimates that reported approximately 14% of all US hospitals participating in a Medicare ACO program in 2012-2013.[23] Similarly, a CMS report indicated that 423 hospitals, or approximately 8.5% of all US acute care hospitals, participated in the Bundled Payments for Care Improvement program in the first 3 years.[24] Less than 5% (n = 69) of the sample hospitals were participating in both programs. A majority of the sample hospitals were private not-for-profit hospitals (70.6%), followed by public not-for-profit (21.1%) and for-profit (8.4%) hospitals. More than 60% of the sample hospitals were affiliated with a system, and approximately one-third (34.1%) were teaching hospitals. Nearly two-thirds of the sample hospitals (63.9%) were located in urban areas. Notably, a comparison of the sample hospitals with other acute care, general service hospitals that did not respond to the survey indicates significant differences in many organizational and community characteristics (Table 3). In general, this comparison suggests that respondents to the survey tended to be larger, private, not-for-profit teaching hospitals located in urban areas. Given these differences and research demonstrating that these characteristics may affect participation in value-based

TABLE 2. Study Variable Operationalizations

Variable	Operationalization
Care Coordination Activities	
Degree of adoption	Sum of 12 dichotomous care coordination items indicating whether the hospital used that care coordination activity
Degree of spread	Average of 12 care coordination items that ranged from 1 ("used minimally") to 4 ("hospitalwide")
Value-Based Program Participation	
Bundled payment participation	1, hospital participates in any type of bundled payment program; 0, hospital does not participate in any type of bundled payment program
ACO program participation	1, hospital participates in any type of ACO; 0, hospital does not participate in any type of ACO
Organizational Controls	
Ownership	Three dummy variables representing private not-for-profit hospitals, public/government not-for-profit hospitals, and for-profit hospitals (referent)
System affiliation	1, member of system; 0, independent hospital
Teaching status	1, either having a residency training approval by Accreditation Council for Graduate Medical Education, medical school affiliation reported to American Medical Association, member of Council of Teaching Hospitals of the Association of American Medical Colleges, or residency approved by the American Osteopathic Association; 0, not a teaching hospital
Contract management	1, contract-managed; 0, not contract-managed
Network membership	1, hospital participates in a network; 0, hospital does not participate in a network
Size	Number of licensed beds set up and staffed for use
Nurse skill mix	Percentage of total hospital nurses who are registered nurses
Percentage Medicare days	Percentage of total patient days accounted for by Medicare patients
Percentage Medicaid days	Percentage of total patient days accounted for by Medicaid patients
Community Controls	
Geographic location	1, located in urban county; 0, located in a rural county
Percentage minority	Percentage of county residents who were nonwhite
Percentage ≥65 years	Percentage of county residents 65 years or older
Socioeconomic status	A composite measure constructed by standardizing 4 community variables—(1) percentage of county residents below federal poverty level, (2) percentage of county residents with less than a high school education, (3) percentage of county residents who were unemployed, and (4) percentage of county residents who were uninsured—and summing across these variables. Higher values of this variable indicated lower socioeconomic status of county residents, on average.
Herfindahl-Hirschman Index	Sum of square of hospital market share in a hospital service area, based on number of licensed beds set up and staffed for use
Physicians per 1000 residents	Total number of physicians in a county, divided by number of county residents, multiplied by 1000
No. of nursing homes	Number of nursing homes in a county
No. of home health agencies	Number of home health agencies in a county

ACO indicates accountable care organization.

programs,[23] we control for these factors in the multivariate analyses. Nevertheless, these differences should be taken into consideration when interpreting the results presented below.

Care Coordination

On average, sample hospitals had adopted two-thirds of the 12 potential care coordination activities (mean [SD] = 7.9 [4.4]) (Table 3). Among those hospitals adopting at least 1 care coordination activity, there was a moderate degree of care coordination spread (mean [SD] = 2.5 [0.6]). Of the individual care coordination activities, medication reconciliation was the most widely adopted, with 99% of the sample hospitals having adopted it. This was followed by telephonic outreach to discharged patients, with nearly 95% of the sample hospitals reporting some use. The least commonly adopted care coordination activity, on average, was arrangement of home visits for homebound and complex patients, with a little more than two-thirds (68.9%) of the sample hospitals reporting some use.

Among those hospitals adopting a specific care coordination activity, the most widely spread care coordination activity was the use of hospitalists for inpatients (mean [SD] = 3.6 [0.7]; range, 1-4), followed closely by medication reconciliation (mean [SD] = 3.5 [0.8]). The least widely spread care coordination activity was the use of predictive analytic tools to identify individual patients at high risk of poor outcomes (mean [SD] = 2.0 [1.0]). This was followed closely by the use of post–hospital discharge continuity of care programs (mean [SD] = 2.1 [1.0]) and nurse case managers (mean [SD] = 2.1 [1.1]).

Multivariate Results

On average, hospital participation in an ACO was associated with the adoption of 3.07 more care coordination activities compared with hospitals that were not participating in an ACO (P <.001) (**Table 4**). Likewise, hospitals that were participating in an ACO reported more extensive spread of these care coordination activities (b = 0.16; P <.01).

Similar to ACO participation, hospital participation in a bundled payment program was associated with the adoption of 1.84 more care coordination activities, on average, compared with hospitals that were not participating in a bundled payment program (P <.001). In contrast to ACO participation, however, hospital participation in a bundled payment program was not significantly associated with greater spread of these care coordination activities within a hospital (b = –0.04; P = .54).

As a supplementary analysis, we also tested whether the participation of a hospital in both programs was associated with greater adoption and spread of care coordination activities. We did so by reestimating the models and including a multiplicative interaction term between ACO participation and bundled payment program participation. The results of this analysis (available from the authors upon request) indicate that hospitals participating in both programs adopted numbers of care coordination activities (mean = 10.7) similar to those of hospitals participating in only an ACO (mean = 10.6) or only a bundled payment program (mean = 10.2), none of which were statistically significantly different. In contrast, hospitals participating in both programs reported less spread of care coordination activities (mean = 2.4) compared with hospitals participating in only an ACO (mean = 2.7; difference not significant [$P = .38$]) or only a bundled payment program (mean = 2.6; $P < .01$). In this case, the average spread of care coordination activities for hospitals participating in both programs was comparable with that for hospitals participating in neither program (mean = 2.4).

DISCUSSION

Our analysis reveals that hospitals have adopted a relatively large number of the 12 coordination activities named in the AHA survey. However, certain activities, such as medication reconciliation and the use of hospitalists, were more widely spread throughout hospitals. One explanation for such variations is that the business case for some of these activities may be more salient for hospitals relative to other care coordination activities. For example, medication reconciliation may directly reduce adverse drug interactions that have the potential to increase length of stay and hospital costs. Likewise, it is possible that the evidence supporting the effectiveness of these activities at improving care coordination and quality is stronger,[1] and this evidence has resulted in greater adoption by hospitals. Alternatively, it is possible that hospitals adopt these activities for normative rather than instrumental reasons.[25-27] For example, the professionalization of hospitalists over the past 2 decades has created pressure for their use by hospitals,[28-30] irrespective of whether

TABLE 3. Sample Characteristics

Variable	Sample Hospitals (n = 1648)	Rest of US General Acute Care Hospitals (n = 2946)	Test of Differences[a]
Care coordination activities, mean (SD)			
Degree of adoption	7.9 (4.4)		
Degree of spread	2.5 (0.6)		
Bundled payment, n (%)			
Participating	147 (8.9)		
Not participating	1501 (91.1)		
ACO, n (%)			
Participating	298 (18.1)		
Not participating	1350 (81.9)		
Organizational controls			
Ownership, n (%)			**χ^2 = 177.45; *P* <.001**
Private, not-for-profit	1160 (70.6)	1579 (53.6)	
Public, not-for-profit	346 (21.1)	697 (23.7)	
For-profit	138 (8.4)	670 (22.7)	
System affiliation, n (%)			$\chi^2 = 2.41$; $P = .12$
Member of system	1013 (61.5)	1858 (59.2)	
Independent	635 (38.5)	1283 (40.8)	
Teaching status, n (%)			**χ^2 = 50.9; *P* <.001**
Teaching hospital	562 (34.1)	766 (24.4)	
Nonteaching hospital	1086 (65.9)	2375 (75.6)	
Contract management, n (%)			**χ^2 = 9.39; *P* <.01**
Contract-managed	152 (9.2)	297 (13.2)	
Not contract-managed	1496 (90.8)	1955 (86.8)	
Network membership, n (%)			**χ^2 = 34.59; *P* <.001**
Network member	698 (42.3)	805 (36.3)	
Not a network member	950 (57.7)	1410 (63.7)	
No. of licensed beds set up for use, mean (SD)	206.5 (228.1)	145.0 (167.5)	**t = –9.66; *P* <.001**
Nurse skill mix, mean (SD)	0.90 (0.12)	0.87 (0.12)	**t = –7.87; *P* <.001**
Percentage Medicare days, mean (SD)	50.69 (18.25)	48.27 (22.01)	**t = –4.06; *P* <.001**
Percentage Medicaid days, mean (SD)	19.54 (15.57)	17.60 (15.17)	**t = –4.17; *P* <.001**
Community controls			
Geographic location, n (%)			**χ^2 = 21.19; *P* <.001**
Rural hospital	595 (36.1)	1350 (43.0)	
Urban hospital	1053 (63.9)	1791 (57.0)	
Percentage minority, mean (SD)	18.0 (15.8)	18.3 (16.1)	$t = 0.67$; $P = .50$
Percentage ≥65 years, mean (SD)	14.6 (3.7)	14.9 (4.2)	**t = 2.16; *P* <.05**
Socioeconomic status,[b] mean (SD)	–0.28 (2.4)	0.22 (2.6)	**t = 6.42; *P* <.001**
Herfindahl-Hirschman Index, mean (SD)	0.55 (0.35)	0.58 (0.35)	**t = 3.11; *P* <.01**
Physicians per 1000 residents, mean (SD)	2.35 (4.93)	1.97 (4.85)	**t = –2.52; *P* <.05**
No. of nursing homes, mean (SD)	1.05 (3.69)	0.93 (3.27)	$t = –1.06$; $P = .29$
No. of home health agencies, mean (SD)	36.87 (115.2)	36.45 (120.1)	$t = –0.12$; $P = .91$

ACO indicates accountable care organization.

[a]Bolded values indicate significant ($P < .05$) differences between sample hospitals and rest of US hospitals.

[b]Higher values indicate lower socioeconomic status.

TABLE 4. ACO Participation and Care Coordination Activity Regression Results[a]

	Adoption b (SE)	Spread b (SE)
Intercept	5.76 (1.81)***	2.73 (0.21)***
ACO participation	3.07 (0.31)***	0.16 (0.05)**
Bundled payment program	1.84 (0.31)***	−0.04 (0.06)
Organizational controls		
Ownership		
For-profit	Referent	Referent
Private, not-for-profit	−0.55 (0.40)	−0.07 (0.06)
Public, not-for-profit	−0.21 (0.46)	−0.21 (0.07)**
System-affiliated hospital	−0.59 (0.26)*	0.04 (0.04)
Teaching hospital	0.25 (0.29)	0.03 (0.04)
Contract-managed hospital	−0.11 (0.37)	−0.03 (0.07)
Network member hospital	−0.65 (0.24)*	−0.03 (0.04)
No. of licensed beds set up for use/50	0.14 (0.03)***	−0.01 (0.01)
Nurse skill mix	0.15 (1.02)	0.06 (0.17)
Percentage Medicare days	0.01 (0.01)	−0.01 (0.001)
Percentage Medicaid days	0.01 (0.01)	−0.01 (0.001)
Community controls		
Rural hospital	−0.57 (0.32)	0.01 (0.05)
Medicare managed care penetration	−0.02 (0.01)*	0.001 (0.001)
Percentage minority	0.01 (0.01)	0.001 (0.001)
Percentage ≥65 years	0.04 (0.04)	−0.01 (0.005)**
Socioeconomic status	−0.06 (0.09)	−0.01 (0.01)
Herfindahl-Hirschman Index	1.26 (0.49)*	0.01 (0.07)
Physicians per 1000 residents	−0.03 (0.07)	−0.01 (0.01)
No. of nursing homes	0.11 (0.05)*	0.01 (0.01)
No. of home health agencies	−0.01 (0.001)*	0.001 (0.001)
Health status of community	0.24 (0.56)	0.01 (0.08)
Adjusted R^2	0.13	0.07
n	1630	1339

ACO indicates accountable care organization.

*P <.05; **P <.01; ***P <.001.

[a]Results based on ordinary least squares regression models.

they do, in fact, improve quality. Regardless of the underlying reason, our analysis shows that an opportunity exists to increase the use of effective care coordination activities by hospitals.

Our analysis also revealed that both ACO and bundled payment program participation were associated with greater adoption of care coordination activities. Both ACOs and bundled payment programs are approaches to integrating resources and efforts across the care delivery continuum by creating accountability for a defined patient population or episode of care.[31,32] The premise of these programs is that global payments can alter fee-for-service reimbursement methods by incorporating shared savings arrangements. Under these arrangements, providers are eligible to share in savings generated by avoiding adverse outcomes. Improvements in care coordination are assumed to be a primary avenue providers can take to avoid these adverse outcomes, achieve cost reductions, and generate shared savings.[33] Although our study does not definitively establish care coordination as the underlying mechanism by which these programs reduce adverse outcomes and achieve savings, it does suggest that these programs are associated with greater adoption of care coordination by hospitals and may be effective at combating the fragmentation and disincentives to coordination often created by the traditional fee-for-service reimbursement systems in the United States.[34] It is possible that the financial incentives and structural changes enabled by ACO and bundled payment participation are directly responsible for increases in the adoption and spread of care coordination activities among participating hospitals. Alternatively, some hospitals may have characteristics that make them simultaneously more likely to engage in care coordination activities and more likely to engage in ACOs or bundled payment programs.

Our analysis also revealed, however, that ACO membership was significantly associated with greater spread of care coordination activities within hospitals, whereas participation in a bundled payment program was not. One explanation for the observed difference is that ACOs are more comprehensive programs that entail more pervasive changes in how providers relate to each other to coordinate care. In contrast, hospitals can enter into condition-specific bundled payment arrangements that may entail circumscribed changes to their care coordination activities. Put another way, more widespread implementation of some of the care coordination activities we examined may not be as valuable for succeeding in a bundled payment program. For instance, predictive analysis tools and prospective management of chronically ill patients are often used to identify patients at risk of poor care while they are in the community. Thus, they may have less utility for managing patients in a bundled payment program who have already sought out care. Future research might consider whether there are qualitative differences in the types of care coordination activities adopted by hospitals participating in these 2 programs.

Another explanation for this observed difference pertains to hospitals' experience with these programs. Many organizations, especially complex ones like hospitals, do not simultaneously adopt and implement an innovation enterprisewide. Instead, they pilot an innovation, such as a new care coordination activity, in a limited capacity (eg, single unit) before attempting to spread it to the rest of the organization. This approach allows an organization to leverage its history and experience with an innovation to determine the feasibility and value of implementing it elsewhere in the organization, as well as to identify opportunities to refine the implementation process.[35-37]

With respect to the value-based programs we examined, the ACO concept began to emerge more than a decade ago,[38] and incentive programs tied to ACOs (eg, Advanced Payment ACO Model and Pioneer ACO Model) were introduced in 2011 and 2012. Bundled payment programs, in contrast, were introduced later, with the most prevalent program being the Bundled Payments for Care

Improvement initiative that was introduced in 2013. It is plausible that limited experience with bundled payment programs has provided insufficient opportunities for hospitals to learn how to best spread these activities throughout the organization to succeed in these programs.

Policy and Practice Implications

Our findings highlight the important role that value-based programs may play in improving care coordination by hospitals and in counteracting a fragmented delivery system. Given other research findings that demonstrate the positive effects of care coordination activities on quality,[1,39-41] our findings also provide some preliminary evidence for the mediating role of care coordination in the value-based program–quality relationship.[11-14,42] Collectively, these findings point to the importance of continuing to support and potentially expanding these programs.

Our results also add interesting context to prior research that suggests that observed cost savings among ACOs may not be the result of improvements in care coordination.[42,43] On one hand, the failure of ACOs to achieve cost savings through improved care coordination is not surprising, given the sample hospitals' above-average level of adoption but moderate level of spread of care coordination activities. This may suggest that ACO and bundled payment programs are sufficient for facilitating adoption but not on a scale that results in cost savings. It may be that policy makers need to alter the ACO or bundled payment programs to improve the spread of care coordination processes and achieve the maximum possible cost savings. On the other hand, our results do show an association between ACO participation and the adoption and spread of care coordination activities during the early years of these value-based payment programs. This suggests that hospitals participating in ACOs could be making efforts to improve care coordination. If the care coordination efforts we have observed are nascent attempts to respond to value-based programs, perhaps we can expect future increases in the adoption and spread of care coordination efforts that ultimately result in greater cost savings, even without changes to the ACO or bundled payment programs. Either way, we believe that a thorough understanding of the effects of value-based programs requires not only looking at outcomes but also understanding how program participation may be changing care coordination processes.

Limitations

The findings of our analysis should be interpreted in light of several limitations. First, the sample of hospitals used in the analysis may not be representative of all US acute care hospitals. The data were based on a supplemental survey conducted by the AHA that included about 1700 hospitals, or approximately one-third of all US acute care hospitals. A comparison of the hospitals in our analysis with the overall US acute care hospital population indicated significant differences (Table 3). Despite this shortcoming, these data are, to our knowledge, the most comprehensive available with respect to care coordination by hospitals and are beneficial for providing a snapshot of these important activities.

A second potential limitation of the analysis pertains to our measures of care coordination. Accurate responses to these questions require knowledge of processes and practices across an entire enterprise, which may be more difficult in certain types of hospitals (eg, large, complex systems). The responses also assume that respondents from different hospitals have similar definitions of the care coordination activities; therefore, different forms (or degrees of implementation) of similar care coordination activities cannot be accounted for. Furthermore, it is possible that the responses reflect a level of social desirability, with respondents wanting their hospitals to appear more progressive in terms of their care coordination activities. Third, our measures of value-based program participation were based on self-report and included programs sponsored by multiple payer types (eg, CMS or private pay) and thus could not be verified with other data sources. Similarly, these measures were not able to capture some of the nuances of participation. Future research could build on our results, for example, by examining whether the use of care coordination activities, overall or for specific activities, differs among certain types of ACOs (eg, physician-led vs hospital-led).

CONCLUSIONS

Despite evidence of their positive effects on quality, our study demonstrates that there is room to improve the extent to which hospitals use care coordination activities. Notably, these opportunities are not evenly distributed, with hospitals reporting extensive use of some activities and minimal use of others. Value-based programs such as ACOs and bundled payment programs appear to have the potential of improving the use of care coordination activities by hospitals. ■

Author Affiliations: Department of Health Services Administration, School of Health Professions, University of Alabama at Birmingham (LRH, NC, AH), Birmingham, AL.

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Address Correspondence to: Larry R. Hearld, PhD, Department of Health Services Administration, School of Health Professions, University of Alabama at Birmingham, 3201 1st Ave N, Birmingham, AL 35222. Email: lhearld@uab.edu.

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