Medicare's Bundled Payment Model Did Not Change Skilled Nursing Facility Discharge Patterns

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ABSTRACT

OBJECTIVES: To evaluate whether participation in Medicare's voluntary Bundled Payments for Care Improvement (BPCI) model was associated with changes in discharge referral patterns to skilled nursing facilities (SNFs), specifically number of SNF partners and discharge concentration.

STUDY DESIGN: Retrospective observational study using difference-in-differences analysis.

METHODS: We used Medicare claims data from 2010 to 2015 to identify admissions for lower joint replacement surgery and the following medical conditions: congestive heart failure, renal failure, sepsis, pneumonia, urinary tract and kidney infections, chronic obstructive pulmonary disease, and stroke. We used difference-in-differences analyses to assess changes in discharge patterns among BPCI-participating hospitals compared with matched control hospitals.

RESULTS: Our analytic sample included 3078 acute care hospitals and 14,866 Medicare-certified SNFs in the United States, encompassing more than 47 million hospital discharges. Of these hospitals, 416 participated in BPCI, with the majority selecting into joint replacement episodes (n = 295). BPCI participation was not associated with any change in number of SNF partners (increase by 0.8 SNFs among BPCI hospitals relative to non-BPCI hospitals; 95% CI, −0.2 to 1.9; *P* = .11) or in discharge concentration (increase in Herfindahl-Hirschman Index of 0.2 among BPCI hospitals relative to non-BPCI hospitals; 95% CI, −68.7 to 69.1; *P* = .36). Results did not vary across clinical conditions and were robust across duration of BPCI participation and with different comparison groups.

CONCLUSIONS: Hospital participation in BPCI was not associated with changes in the number of SNF partners or in discharge concentration relative to non-BPCI hospitals. More research is needed to understand how hospitals are responding to bundled payment incentives and specific practices that contribute to improvements in cost and quality.

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In 2013, CMS implemented the Bundled Payments for Care Improvement (BPCI) program. In this voluntary bundled payment arrangement, participating hospitals select from 48 clinical episodes, including the inpatient stay plus all related services up to 30, 60, or 90 days after hospital discharge.[1] Medicare continues to make fee-for-service payments, but total expenditures are later reconciled against a target price for an episode of care. By linking payments for services across settings, BPCI shifts the financial responsibility of postdischarge care to hospitals and incentivizes coordination between hospitals and postacute care providers, including skilled nursing facilities (SNFs).[2]

As a primary driver of cost growth and variation in Medicare spending,[3] postacute care constitutes a specific target for programs like BPCI.[4] In 2015, approximately 20% of all Medicare fee-for-service hospital admissions ended in postacute care in a SNF, accounting for 1.7 million beneficiaries annually.[5] Care fragmentation likely contributes to these cost and utilization burdens; on average, each hospital currently works with nearly 40 SNFs, the majority of which account for 1% or less of total referrals each.[6] Moreover, national estimates suggest that connections between hospitals and SNFs have weakened over recent years.[7]

In this context, a potential response to bundled payment incentives is that hospitals may more carefully select where they refer patients after discharge in an effort to concentrate discharges and improve care coordination with those SNFs. Research has demonstrated that tighter relationships between hospitals and SNFs may be associated with reductions in readmission rates,[8-10] hospital length of stay,[11,12] and total costs of care,[13] each of which are goals for bundled payment. Emerging evidence suggests that some hospitals have begun concentrating their discharge referrals and care management efforts to a smaller group of postdischarge facilities,[14,15] including as a response to participation in bundled payment models.

Whether bundled payment indeed encourages hospitals to concentrate their discharges to a smaller group of SNFs is an area of growing interest. Understanding hospital responses to payment initiatives may help health systems and policy makers to both guide bundled payment design and policy adjustments and optimize

TAKEAWAY POINTS

Hospitals participating in Medicare's Bundled Payments for Care Improvement model did not concentrate skilled nursing discharges among smaller groups of skilled nursing facilities (SNFs).

- Under bundled payment, hospitals bear financial responsibility for SNF care but may perceive themselves as constrained in their ability to direct patients to specific providers, which may limit shifts in referral patterns.
- Hospitals may respond to bundled payment in ways that do not affect discharge flows, such as sharing electronic health records, monitoring SNF performance, and hiring care coordinators to track patients after discharge.
- Further research is needed to assess specific hospital responses to bundled payment and their impacts on cost and quality.

outcomes for those patients receiving SNF care. Our objective was to evaluate the association of voluntary BPCI participation with changes in referral patterns to SNFs, using nonparticipating hospitals as matched controls and focusing on 2 measures of hospital–SNF integration: (1) the number of SNF partners per hospital and (2) the extent to which hospitals concentrate their discharges to SNFs.

METHODS

Data and Study Sample

Using the Medicare Provider of Service file, we identified US acute care hospitals and Medicare-certified SNFs from 2010 to 2015. We excluded new hospitals and SNFs that entered the market after 2010, hospitals outside the 50 states and the District of Columbia, and critical access hospitals. We linked this facility-level file to the 100% Medicare Provider Analysis and Review files and the Medicare Beneficiary Summary File to identify all Medicare beneficiaries who were admitted to a US acute care hospital and had a SNF claim within 3 days of discharge between January 1, 2010, and December 31, 2015.

We flagged beneficiaries hospitalized for lower joint replacement surgery using Medicare Severity–Diagnosis Related Groups (MS-DRGs) 469 or 470 for major hip or knee replacement or reattachment of the lower extremity with or without a major complicating or comorbid condition, respectively. We also identified beneficiaries who were hospitalized for a variety of medical conditions, including congestive heart failure (MS-DRGs 291-293), renal failure (MS-DRGs 682-684), sepsis (MS-DRGs 870-872), simple pneumonia and respiratory infections (MS-DRGs 177-179, 193-195), urinary tract and kidney infections (MS-DRGs 689-690), chronic obstructive pulmonary disease (MS-DRGs 190-192, 202-203), and stroke (MS-DRGs 61-66). These diagnosis groups account for the most common diagnoses that end in SNF stays after hospitalization, and they correspond to clinical episodes from which BPCI participants are able to choose.

Our sample was restricted to hospitals with at least 5 total discharges per half-year and to hospitals and SNFs within the same market with at least 1 discharge connection between them per half-year. Markets were defined using Dartmouth Atlas' hospital referral regions (HRRs), representing healthcare markets for tertiary medical care. Patients discharged to a SNF outside the hospital's HRR were not included in our analyses because they do not reflect typical patterns of care and represent a small fraction of all hospital–SNF discharges. Beneficiaries were included if they were enrolled in Medicare parts A and B, Medicare was not their secondary payer, and they were discharged alive from the hospital.

BPCI Participants and Control Hospitals

We used publicly available data from CMS to identify hospitals participating in Model 2 bundles through BPCI. BPCI has 4 participation models; Model 2 is used by 95% of participants.[1] An episode of care includes a Medicare beneficiary's inpatient stay in the acute care hospital, postacute care, and all related services ending either 30, 60, or 90 days after hospital discharge. All episodes within BPCI Model 2 were included in the analysis regardless of the episode duration chosen by the hospital. Because BPCI implementation was gradual over time, our analysis accounted for each hospital's model start date.

A population of non–BPCI-participating hospitals was selected for comparison. To minimize bias from potential spillover effects, nonparticipating hospitals were excluded if they were located in a market with BPCI-participating hospitals. Using nearest-neighbor propensity score matching based on hospital characteristics, each BPCI-participating hospital was matched with up to 3 comparison hospitals. Variables used to match hospitals included urban/rural location, teaching hospital, hospital ownership, annual discharges to SNF, and certified bed count.[16,17] Because lower extremity joint replacement episodes are the most commonly selected episode in BPCI, we also evaluated these participants separately, matching a different population of control hospitals. This match included the same group of variables, plus a variable reflecting annual discharges for joint replacement procedures. We report only the results of 1:1 matching given similar results.

Measures of Hospital–SNF Integration

We adopted 2 measures of hospital–SNF integration used previously.[7] The first was a hospital's number of SNF partners, or the total number of unique SNFs to which a hospital discharged its patients for each half-year of our study period. The second was a hospital's discharge concentration in each half-year. Discharge concentration was based on the Herfindahl-Hirschman Index (HHI), a common measure of market concentration. The HHI was calculated by squaring the share of discharges to each SNF and summing across all SNFs to which a hospital discharged its patients. Values range from 0 to 10,000, with larger values representing a more concentrated discharge pattern.

Statistical Analysis

We evaluated hospital-level trends in the number of SNF partners and in discharge concentration. Descriptive statistics were reported

using means and SDs for continuous variables and percentages for categorical variables.

The primary analysis relied on a difference-in-differences approach that quantified the associations of the hospital–SNF linkage measures with BPCI by comparing changes in these measures between the baseline and intervention periods for BPCI and control hospitals. This approach minimizes biases from time-invariant differences between BPCI and comparison hospitals and controls for secular trends. A critical identification assumption underlying the difference-in-differences approach is that, in the absence of the BPCI program, discharge patterns among hospitals in the treatment and control groups would be expected to change at the same rate. We performed visual inspections to confirm that our parallel pretrends assumption was not violated. To further test our identification assumption, we estimated regressions that included interactions between the BPCI participation indicator and indicators for half-years in the period prior to BPCI participation (2010-2012), and we used an F-test to jointly test the null hypothesis that these interaction terms equal zero. Multivariable regression models with hospital fixed effects were estimated for each outcome and included a BPCI–hospital indicator, intervention period indicators, and the interaction between the two. All analyses used robust standard errors, and statistical significance was assessed at the 5% level. Analyses were conducted in Stata 14.1 (Stata Corp; College Station, Texas).

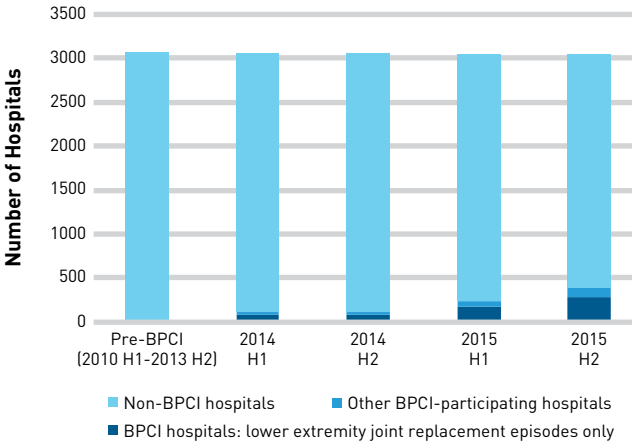
We repeated these analyses for hospitals participating only in lower extremity joint replacement episodes and also for participation in these medical episodes: congestive heart failure, renal failure, sepsis, simple pneumonia and respiratory infections, urinary tract and kidney infections, chronic obstructive pulmonary disease, and stroke. Sensitivity analyses included lagging the BPCI participation indicator by 1 half-year to allow more time for changes in discharge patterns to be detected. We also performed a secondary analysis on early BPCI participants only. We separately evaluated lower extremity joint replacement discharges with (MS-DRG 469) and without (MS-DRG 470) major clinical complications to distinguish possible variation in hospital discharge practices for different groups of patients. Finally, we reran these analyses using different sets of matched non-BPCI hospitals obtained from varying our matching criteria (eg, matching with and without replacement).

RESULTS

Our original analytic sample (before propensity score matching) included 3078 acute care hospitals and 14,866 Medicare-certified SNFs in the United States from 2010 to 2015, encompassing more than 47 million hospital discharges. There were 416 unique hospitals participating in BPCI, with the majority of participants selecting joint replacement episodes (n = 295). Most hospitals joined the program in 2015 (**Figure 1**).

Hospitals that participated in BPCI differed from those that did not (**Table**). BPCI-participating hospitals were more likely to have a higher number of total discharges (3369.8 vs 1778.3; P <.001), discharges for lower joint replacement (154.0 vs 79.8; P <.001), and discharges to SNF (543.7 vs 286.2; P <.001). BPCI-participating hospitals were also larger (364.1 vs 222.2 beds; P <.001) and more likely to be nonprofit (77.2% vs 58.8%; P <.001) and teaching (31.1% vs 16.4%; P <.001) hospitals. They were less likely to be located in rural areas (92.3% vs 69.2%; P <.001). Matched comparison hospitals for each of the BPCI participants were not statistically different with respect to hospital characteristics.

FIGURE 1. BPCI-Participating Hospitals, 2010-2015[a]



BPCI indicates Bundled Payments for Care Improvement; H, half.

[a]Hospital counts exclude new hospitals that entered the market after 2010, hospitals outside the 50 states and the District of Columbia, and critical access hospitals. The horizontal axis shows a half-year time period.

Source: Authors' analysis of publicly available files from CMS.

Compared with matched controls, BPCI-participating hospitals had a higher baseline number of SNF partners and a lower discharge concentration (**Figure 2**). On average, BPCI hospitals had 31 SNF partners and a discharge concentration of 1768. Hospitals participating only in lower extremity joint replacement episodes had a lower baseline number of SNF partners (mean = 11) and a higher discharge concentration (mean = 3068) compared with BPCI participants in other clinical episodes (not shown). These measures did not change significantly across BPCI-participating hospitals from 2010 to 2015, nor did trends in these measures appear different for matched controls.

Figures 3 and **4** show the difference-in-differences estimators, with overlapping 95% CIs, for changes in number of SNF partners and discharge concentration among discharges with different clinical conditions at BPCI hospitals compared with non-BPCI hospitals. Relative to the matched comparison population of non-BPCI hospitals, BPCI participation inclusive of all clinical conditions was associated with an increase of 0.8 SNF partners (95% CI, −0.2 to 1.9; P = .11). Participants in lower extremity joint replacement episodes saw an increase of 0.5 SNF partners for related discharges compared with nonparticipants (95% CI, −0.6 to 1.7; P = .36), with a smaller relative

TABLE. Selected Characteristics of BPCI, Non-BPCI, and Matched Hospitals[a]

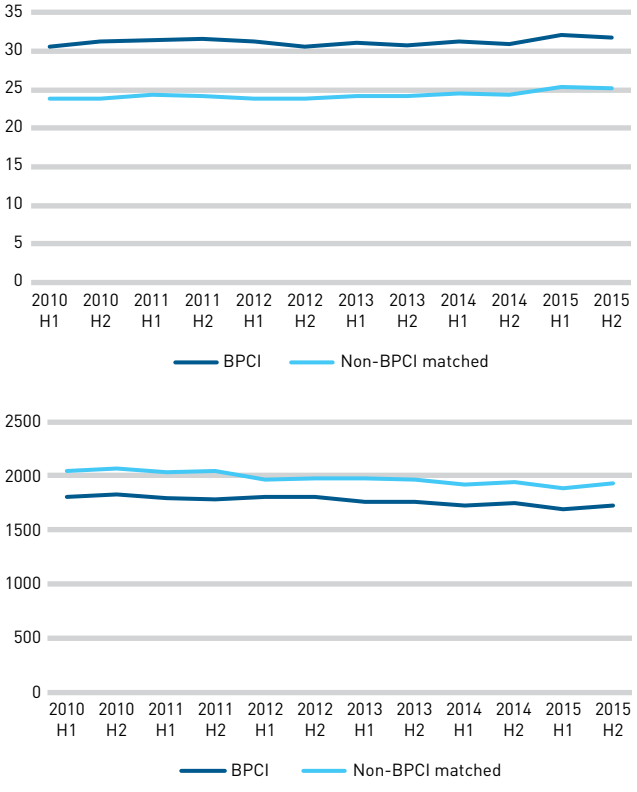
	BPCI (n = 416)	Non-BPCI (n = 2719)	Matched Non-BPCI (n = 416)
Total discharges, mean (SD)	3369.84 (2372.31)	1813.79 (1778.25)*	3069.91 (2056.11)
Lower joint discharges, mean (SD)	154.00 (152.59)	79.84 (95.14)*	149.16 (123.02)
Total discharges to SNF, mean (SD)	543.71 (393.18)	286.20 (299.33)*	484.30 (347.50)
Certified bed count, mean (SD)	364.08 (277.23)	222.16 (213.71)*	330.99 (236.89)
Hospital ownership, %			
Government	7.7	19.9*	7.9
For-profit	15.1	21.4	13.5
Nonprofit	77.2	58.8	78.6
Rural, %	7.7	30.8*	6.0
Teaching hospital, %	31.1	16.4*	29.1

BPCI indicates Bundled Payments for Care Improvement; SNF, skilled nursing facility.

*P <.001.

[a]P values were calculated using the unpaired t test for continuous variables and Pearson χ^2 for categorical variables (all 2-tailed). We report only the results from 1:1 matching given little marginal improvement but increased bias in the estimated treatment effect with a greater number of matches.

FIGURE 2. Unadjusted Trends in Hospital–SNF Integration for BPCI Hospitals Versus Matched Controls, 2010-2015[a]



BPCI indicates Bundled Payments for Care Improvement; H, half; SNF, skilled nursing facility.

[a]Unadjusted trends are shown for 2 measures, number of SNF partners and discharge concentration, for all BPCI-participating hospitals and non–BPCI-participating hospitals from 2010 to 2015.

Source: Authors' analysis of publicly available files from CMS.

increase in SNF partners for joint replacement discharges with major clinical complications compared with those without complications. Likewise, BPCI participation was not associated with any change in discharge concentration relative to the comparison population, and results did not vary across clinical conditions. Sensitivity analyses were robust across duration of BPCI participation and different comparison groups (**eAppendix** [available at **ajmc.com**]).

DISCUSSION

In this observational study, we hypothesized that bundled payments would incentivize participating hospitals to concentrate SNF discharges to fewer providers as a mechanism for improving care coordination and controlling costs. However, we found no discernible changes in 2 measures of hospital–SNF integration among BPCI participants compared with matched controls over the study period. These results are consistent with a recent study that showed no differences in the proportion of patients discharged to the SNFs most utilized by hospitals among BPCI participants with the greatest success in reducing Medicare payments.[18] Our findings add to ongoing research around bundled payment models, which has largely focused on effects on costs and quality without identifying the specific care redesign mechanisms that are driving outcomes.[16,17]

Our findings hold particular relevance given that there has been a growing trend toward voluntary bundled payment models. Although CMS began testing a mandatory model of bundled payments for lower extremity joint replacement episodes through the Comprehensive Care for Joint Replacement (CJR) model in April 2016,[19] CJR was recently modified to allow for voluntary participation.[20] A new voluntary bundled payment model called BPCI Advanced was launched in October 2018, testing 32 clinical episodes and featuring fewer structural options than BPCI.[21] These bundled payment initiatives will provide more information about responses to bundled payment incentives from a greater sample of hospitals. Although the underlying principles behind these programs are to encourage improvements in care coordination across providers and settings, it remains to be seen whether these models will yield differential responses from participating hospitals compared with those in the BPCI program.

There are a number of possible reasons why we did not observe changes in hospital–SNF discharge patterns after BPCI participation. First, as noted in previous studies,[8,22] hospitals remain concerned about how to steer patients to SNFs while still preserving CMS' requirement for patient choice in the discharge process.[23] As a consequence, most hospitals continue to provide patients with impartial lists of SNFs on discharge.[22] This tension, whereby hospitals have financial responsibility for SNF care but perceive themselves to be limited in their ability to direct patients to specific providers,

may limit more dramatic shifts in referral patterns. Second, BPCI likely affects discharge decisions for patients with specific clinical conditions, rather than for all patients being discharged from a given hospital. In a recent evaluation of hospitals that joined an accountable care organization (ACO), for example, changes in postacute care utilization and payments did not spill over to all beneficiaries admitted to ACO hospitals.[24] BPCI-participating hospitals, likewise, may not be redesigning SNF referral patterns broadly, which is a time- and labor-intensive process.[8]

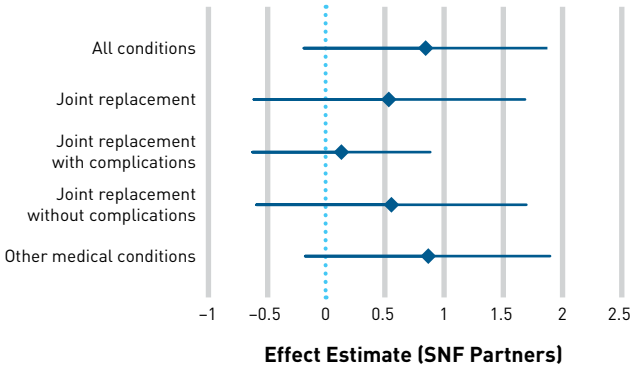
Studies on bundled payment programs for lower joint replacement have demonstrated efficacy in cost containment with little adverse effect on quality,[16] but how hospitals are achieving these results remains unclear. We provide evidence that these outcomes do not appear to be driven by the mechanisms studied in this paper. Rather, cost savings under BPCI for patients undergoing lower joint replacement appear to be driven primarily by rapid reductions in the overall use of institutional postacute care, including skilled nursing.[16] Thus, in the near term, hospitals appear to be shifting toward home-based care after discharge.[25] Recent qualitative data also suggest that hospitals' primary response to bundled payment incentives has been to reduce use of higher-cost SNF care in favor of home health[15]; all of this is consistent with prior work suggesting that payment system changes targeting postacute care settings are associated with shifts in use.[26] Given our findings, it is possible that hospitals are engaging in similar practices that do not lead to between-SNF shifts in discharge patterns.

These practices also may include SNF ownership or preferred SNF networks, arrangements that may allow hospitals to focus their coordination and patient management efforts.[8,10,12] Early evidence suggests that hospitals may be more likely to form such linkages with those SNFs that already share strong relationships, often demonstrated by large discharge referral volumes.[15] Hospitals may also share electronic health records with SNFs, collect data and monitor performance, embed healthcare providers within SNFs, and hire care coordinators to track patients after discharge, all of which could improve patient transitions without affecting discharge flows.[8,14,22] These practices may be among a number of strategies that hospitals are using in the near term. More research is needed to understand the degree to which these practices have been disseminated, and it remains to be seen whether concentrating SNF referrals may be a longer-term strategy.

Limitations

This observational study has several limitations. First, selective program participation may limit the generalizability of these findings. The BPCI program is voluntary, and the hospitals that choose to participate differ from other hospitals.[27] Hospitals selecting into BPCI are typically large and nonprofit and have high clinical volumes for the conditions covered by bundled payment episodes.[28] Although we attempted to control for hospital characteristics that are time invariant, residual confounders may remain due to participation bias. Nonetheless, examining hospitals that are participating in

FIGURE 3. Association Between BPCI Participation and Changes in Number of SNF Partners[a]

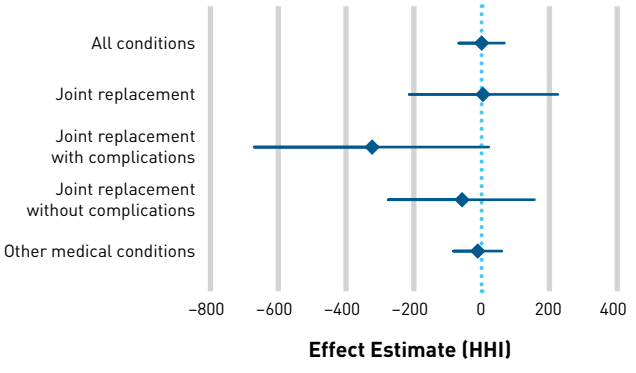


BPCI indicates Bundled Payments for Care Improvement; SNF, skilled nursing facility.

[a]Figure shows effect estimates (diamond symbol) with 95% CIs (horizontal line). The horizontal axis shows the average change in number of SNF partners associated with hospital participation in BPCI. Propensity score matching was performed separately for hospitals participating in any BPCI episodes and for hospitals participating only in lower extremity joint replacement episodes. The category "other medical conditions" includes BPCI episodes for the following clinical conditions, which together account for the most common diagnoses that end in SNF stay after hospitalization: congestive heart failure, renal failure, sepsis, simple pneumonia and respiratory infections, urinary tract and kidney infections, chronic obstructive pulmonary disease, and stroke.

Source: Authors' analysis of publicly available files from CMS.

FIGURE 4. Association Between BPCI Participation and Changes in Discharge Concentration[a]



BPCI indicates Bundled Payments for Care Improvement; HHI, Herfindahl-Hirschman Index.

[a]Figure shows effect estimates (diamond symbol) with 95% CIs (horizontal line). The horizontal axis reflects the average change in HHI (range, 0-10,000, with higher numbers representing more concentrated discharge patterns). Propensity score matching was performed separately for hospitals participating in any BPCI episodes and for hospitals participating only in lower extremity joint replacement episodes. The category "other medical conditions" includes BPCI episodes for the following clinical conditions, which together account for the most common diagnoses that end in SNF stay after hospitalization: congestive heart failure, renal failure, sepsis, simple pneumonia and respiratory infections, urinary tract and kidney infections, chronic obstructive pulmonary disease, and stroke.

Source: Authors' analysis of publicly available data from CMS.

a voluntary program still offers valuable learning opportunities about possible care redesign efforts. Second, numerous changes to hospital payment occurred over our study period, outside of Medicare's bundled payment initiatives. These changes—including growth of Medicare Advantage, ACOs, and value-based purchasing by commercial insurers—could either increase or decrease our estimated effect depending on whether they overlap with hospitals participating in BPCI. Finally, although we did not observe meaningful differences in our subgroup analysis of early BPCI participants, more time may be needed to detect changes in discharge practices.

CONCLUSIONS

An anticipated response to Medicare's bundled payment incentives is that hospitals may increase their selectivity in where they refer patients after discharge in an effort to improve care coordination and thus control costs and quality. In a difference-in-differences analysis of Medicare claims data using matched controls, we found that voluntary BPCI participation was not associated with discharges to fewer SNF partners or increases in discharge concentration, 2 measures of hospital–SNF integration. These findings suggest that hospitals may be using other mechanisms to respond to bundled payment, at least in the short term. Further research is needed to assess how hospitals are changing specific practices and their impacts on patient outcomes. ■

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eAppendix. Comparison of Results From Selected Sensitivity Analyses

	Hospital fixed effects	**Hospital fixed effects, participation lagging by 1 half-year**	**Hospital fixed effects, early participants only, lagging by 1 half-year**	**Propensity score matching with hospital fixed effects, lagging participation by 1 half-year**
Number of SNF partners				
All conditions	0.1 [-0.3, 0.5], p=0.720	0.6 [-0.5, 1.6], p=0.278	1.2 [-0.2, 2.7], p=0.099	0.8 [-0.2, 1.9], p=0.111
All lower extremity joint replacement	-0.2 [-0.7, 0.2], p=0.353	0.2 [-0.9, 1.2], p=0.795	0.5 [-1.1, 2.1], p=0.551	0.5 [-0.6, 1.7], p=0.363
Lower extremity joint replacement, with complications	-0.3 [-0.7, 0.2], p=0.248	0.0 [-0.6, 0.6], p=0.963	0.2 [-0.6, 1.0], p=0.643	0.5 [-0.6, 0.9], p=0.733
Lower extremity joint replacement, without complications	-0.3 [-0.7, 0.2], p=0.290	0.1 [-0.9, 1.2], p=0.801	0.4 [-1.1, 2.0], p=0.582	0.6 [-0.6, 1.7], p=0.581
Other medical conditions	0.5 [0.1, 0.9], p=0.012	0.8 [-0.2, 1.8], p=0.130	1.5 [-0.1, 3.0], p=0.052	0.9 [-0.2, 1.9], p=0.528
Discharge concentration (HHI)				
All conditions	-7.4 [-61.4, 46.6], p=0.787	-12.0 [-79.5, 55.4], p=0.726	-25.4 [-111.9, 61.1], p=0.593	0.2 [-68.7, 69.1], p=0.996
All lower extremity joint replacement	57.4 [-83.2, 198.0], p=0.424	44.4 [-164.03, 252.8], p=0.676	-39.3 [-301.6, 223.0], p=0.769	5.2 [-213.2, 223.7], p=0.962
Lower extremity joint replacement, with complications	-40.1 [-284.7, 204.5], p=0.748	-212.9 [-529.5, 103.7], p=0.187	-310.1 [-702.7, 82.5], p=0.122	-323.7 [-669.6, 22.2], p=0.067

Lower extremity joint replacement, without complications	48.1 [-97.1, 193.4], p=0.516	-19.0 [-223.4, 185.3], p=0.855	-57.2 [-327.9, 213.6], p=0.679	-58.0 [-273.0, 157.1], p=0.597
Other medical conditions	-42.8 [-10.4.3, 18.6], p=0.171	-37.0 [-103.1, 29.2], p=0.273	-87.7 [-162.6, -12.8], p=0.02	-11.8 [-81.9, 58.3], p=0.74

Notes: eAppendix shows effect estimates with 95% confidence intervals and p-values associated with BPCI participation for the outcomes of interest (*number of SNF partners* and *discharge concentration*) across different clinical conditions. Each column represents a different model. Each analytic model was carried out across all clinical conditions ("all conditions"), and again separately for the clinical conditions specified (rows). "Other medical conditions" is a combined category which includes congestive heart failure, renal failure, sepsis, simple pneumonia and respiratory infections, UTI and kidney infections, chronic obstructive pulmonary disease, and stroke