By Christopher M. Whaley, Christoph Dankert, Michael Richards, and Dena Bravata

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CONSIDERING HEALTH SPENDING

An Employer-Provider Direct Payment Program Is Associated With Lower Episode Costs

ABSTRACT **Bundled payment has shown promise in reducing medical spending while maintaining quality. However, its impact among commercially insured populations has not been well studied. We examined the impacts on episode cost and patient cost sharing of a program that applies bundled payments for orthopedic and surgical procedures in a commercially insured population. The program we studied negotiates preferred prices for selected providers that cover the procedure and all related care within a thirty-day period after the procedure and waives cost sharing for patients who receive care from these providers. After implementation, episode prices for three selected surgical procedures declined by $4,229, a 10.7 percent relative reduction. Employers captured approximately 85 percent of the savings, or $3,582 per episode (a 9.5 percent relative decrease), and patient cost-sharing payments decreased by $498 per episode (a 27.7 percent relative decrease).**

Christopher M. Whaley (cwhaley@rand.org) is a policy researcher in health care at the RAND Corporation in Santa Monica, California.

Christoph Dankert is senior vice president of provider partnerships at Carrum Health, in San Mateo, California

Michael Richards is an associate professor of economics at Baylor University, in Waco, Texas.

Dena Bravata is an adjunct affiliate in health policy at Stanford University, in Palo Alto, California.

Health care purchasers in the United States face at least two barriers to addressing rising cost growth. First, the predominant reimbursement model in the US health care system is the fee-for-service model, under which physicians and hospitals receive payment for each service performed.[1,2] A potential adverse consequence of fee-for-service medicine is the financial incentive to overtreat while failing to incentivize high-value care.[3] At the same time, administrative inefficiencies further increase costs of care under fee-for service reimbursement models.[4] These concerns are particularly acute for elective surgical services, which are among the more expensive and increasingly common types of care. Such surgical services can also be accompanied by significant recovery periods, which provide ample opportunity for surgeons' discretion around intraoperative and postoperative treatment to strongly shape the total services and total spending for a given episode of care.

In response to variations in episode cost and quality, the Centers for Medicare and Medicaid Services (CMS) has experimented with two separate bundled payment programs for joint replacement surgeries: the voluntary Bundled Payments for Care Improvement (BPCI) initiative and the mandatory Comprehensive Care for Joint Replacement (CJR) model.[5,6] Recent evidence from each program shows reductions in Medicare per episode spending, especially with respect to postacute care services. However, after provider bonus payments are factored in, the net savings to the Medicare program are relatively small.[7–9] There is little indication that quality of care has deteriorated under the program.[10,11]

Although bundled payment for elective surgical care has demonstrated some success in the Medicare market, its impact among commercially insured populations remains understudied.[12] Previously developed commercial bundled payment programs have faced problems that have hampered their implementation, and thus researchers' ability to study them, including a lack of incentive alignment of providers, payers, and patients; difficulty in identifying providers will-

ing to accept and administer bundled payments; difficulty connecting such providers with payers willing and able to process bundled payments; and challenges in encouraging patients to receive their care under bundled payment arrangements.[13] Empirical evidence is limited to a single health care delivery organization.[14] At the same time, prices for the commercially insured population are high and vary widely, suggesting considerable savings opportunities from shifting patients from higher-price to lower-price high-quality providers.[15]

Some employers have adopted programs such as price transparency, reference pricing, and rewards to shift patients to lower-price providers.[16–20] However, these programs have faced challenges, including low adoption by employers, minimal engagement from patients, and modest changes in behavior. A new potential intervention is to modify Medicare's bundled payment programs, tailoring them for the privately insured market. The near absence of studies of commercially insured populations means that we have little insight as to if, and how well, bundled payment works among a patient population that receives considerable numbers of elective surgeries and is known for paying higher and more variable service prices than patients who are enrolled in Medicare.[21,22]

This article examines the impact of an employer-to-provider direct payment program implemented by several self-insured employers. Under this program, selected providers negotiate bundled payments that hold providers responsible for all costs over a thirty-three-day perioperative period, including three days before the surgery and thirty days after it. In addition, patients who receive care from these providers have no cost sharing. The study provides initial evidence on the impacts of direct payment programs that leverage episode-based provider incentives on health care spending and quality outcomes among commercially insured populations.

Study Data And Methods

BUNDLED PAYMENT INTERVENTION We evaluated a direct payments program developed by Carrum Health that was implemented among self-insured employers between 2016 and 2020. Under the program, prospective bundled payment contracts are negotiated with participating providers. These include academic medical centers, large for-profit health systems, faith-based nonprofit health systems, and surgeon groups. A list of selected participating providers is in online appendix exhibit 1.[23] Participating providers then enter into contracts with the bundle participants (for example, the facility, surgeons, anesthesiologists, and other providers rendering services to a patient receiving surgery in a bundle). Facilities include hospitals and ambulatory surgical centers. The bundled payment contracts cover a range of procedures, of which total knee and hip replacement, spinal fusion, and bariatric weight loss procedures are the most common. A full list of procedures covered by the program is in appendix exhibit 2.[23]

The negotiated contracts are modeled after BPCI Classic Model 4.[24] The contracts hold the provider responsible for the surgical procedure, all preoperative care in the three days before the surgery, and any care to treat related complications, including readmissions, within a minimum of thirty days after the procedure. Notably, because providers—including surgeons—are at risk for any postoperative complications and readmissions, they typically engage proactively with patients to optimize them for surgery (as described below). Providers agree to these contracts to secure a higher volume of procedures, obtain timely reimbursement, and avoid the necessity of collecting out-of-pocket payments from patients.

Participating providers are screened for both facility and individual surgeon quality. Specific quality criteria are based on guidelines developed by CMS, the National Quality Forum, and the Agency for Healthcare Research and Quality and include volume and various procedure-specific intra- and postsurgical complications including readmissions, improvement in patient functional outcomes, and patient satisfaction with the surgeon and facility. Qualitative factors include a commitment to appropriateness of surgeries with regard to the patient's diagnosis and the policies and procedures designed to foster a culture of shared decision making and continuous improvement.[25–33]

To encourage the use of these providers, employers and Carrum Health engage in a wide array of benefit communication efforts and financial incentives. Patients who receive care from participating providers have no cost sharing (for example, copayments, coinsurance, or deductibles). Further, patients are protected against balance bills for out-of-network service.[34] Recent estimates suggest that approximately 20 percent of elective surgeries are accompanied by a surprise balance bill.[35,36] Patients who elect to receive care from nonparticipating providers still covered by insurance are charged standard cost sharing. Patients also have access to a digital application and a concierge service that support the initial screening, identification, and collection of medical records and offer support with any issues that may arise before, during, and after the bundled episode. To further improve

outcomes for patients, the bundles feature additional patient support and screening mechanisms.

On referral from a treating physician, patients are screened for surgical risk factors. For example, potential patients with high body mass index are placed on a weight management program until their body mass index is below the surgeon's threshold. Likewise, patients with poorly controlled diabetes are referred to a diabetes management program to bring their diabetes under the level of control required by the surgeon. Patients also undergo preliminary screening to ensure appropriateness for the procedure. The participating provider reviews whether surgery is appropriate for the patient's clinical circumstances. The specific provider conducting the appropriateness screening depends on the protocol in use at the specific center of excellence. In most cases, registered nurses or advanced practice providers provide an initial screening with final oversight by a physician.

Approximately 30 percent of referred patients were recommended for conservative treatment instead of surgery (for example, physical therapy), and most of those patients followed the recommendation and pursued nonsurgical care. Further analysis is required to quantify how many of these patients would have gone forward with surgery had it not been for their interaction with the program. Participating providers are reimbursed for evaluating patients for appropriateness through a separate assessment bundle if the provider recommends nonsurgical treatment.

MEDICAL CLAIMS DATA We obtained medical claims from eight self-insured employers or purchasing coalitions that implemented the direct payments program and had consistent and accessible data for the period before implementation of the program. Many of these employers manage their health benefits through joint purchasing entities. These purchasing entities represent from 1,000 to more than 50,000 employees each. For each employer, these data contain information on all medical services in the two years before program implementation and all periods going forward. The data include all medical claims information for each enrollee, including those who do not receive the selected surgical services and those who received a service at a provider that did not participate in the direct payments program. We received similar data on patients who underwent any of the surgical procedures through a designated provider who participated in the direct payments program. We restricted the analysis to the three most common procedures, identified by diagnosis-related group (DRG) codes, covered by the direct payments program: spinal fusion (DRG 455), major joint replacement (DRG 470), and bariatric surgery (DRG 621). These three procedures accounted for 89 percent of the procedures administered through the direct payments program and approximately 3 percent of medical spending in the preimplementation period.

From these data we constructed the costs of each surgical episode, including the total negotiated price (for example, the "allowed amount"); the amount paid by employers; and the amount paid by patients in the form of cost-sharing payments, which we calculated as the sum of copayment, coinsurance, and deductible payments. Employer spending and patient cost-sharing payments sum to the negotiated procedure price. We also calculated patient comorbidity measures using the Charlson Comorbidity Index and collected information on patient demographics, including age and sex.[37]

COST ANALYSIS To assess the impacts of the direct payments program on episode prices, employer spending, and patient cost sharing, we leveraged the differential implementation of the program using a differences-in-differences study design.[38] Data from each employer's preimplementation period served as a control for the postimplementation period. Using this approach, we estimated the association between an employer's implementation of the program and each outcome using multivariate regression models. Our results can thus be interpreted as the within-employer difference in each outcome relative to other employers before and after the implementation of the direct payments program.

The multivariate regression models included controls for patient characteristics (comorbidity score, age, and sex). We also included fixed-effect controls for each employer, which controlled for unobserved differences specific to each employer, and for DRGs, which controlled for differences across specific procedures. DRGs also identify patients with and without complications, which further controls for patient risk characteristics. To control for general time trends, we included fixed effects for each quarter of data. We omitted indicators for treatment employers, as these are colinear with the employer fixed-effect controls.

Regression models were estimated using generalized linear regression models with a log-link to address skewness in prices and heteroskedasticity-robust standard errors.[39] Adjusted differences in spending were calculated using the marginal standardization form of predictive margins.[39]

In addition, we used an event study approach to test for differences in trends in outcomes that occurred in two periods: two and more years before program implementation and the period

after implementation. Finding evidence of preimplementation trends would suggest that factors other than the direct payments program explain observed differences in outcomes and indicate a violation of the parallel trends assumption necessary for difference-in-differences study designs. The event study approach can also detect regression-adjusted trends in the post period that inform the impact of the direct payments program over time. This study was approved by the RAND Corporation Institutional Review Board.

SENSITIVITY ANALYSES To ensure the validity of our results, we conducted a number of sensitivity tests. First, to test the robustness of our results to model choice, we estimated linear regression models instead of the nonlinear generalized linear regression models. Second, a concern with our empirical approach is that employers may self-select into the direct payments program based on unobserved characteristics of their employee populations. We tested for evidence of this concern by estimating models that did not include the patient-level covariates, which we hypothesized are correlated with unobserved patient characteristics. Finding similar results when including and excluding patient-level controls would suggest that unmeasured confounding is unlikely to be important. Finally, to test for differences in quality metrics, we used data from both the Healthcare Cost and Utilization Project and the CMS Hospital Readmissions Reduction Program and compared readmission rates between participating providers and national average readmission rates.

LIMITATIONS This study had several limitations. First, the cost impacts we measured do not account for changes in procedure use. Although patients could respond to cost-sharing reductions by increasing procedure use, these procedures are highly invasive, and patients are screened for appropriateness. If the patient screening leads patients to avoid potentially less necessary procedures, then the estimates we report would understate the impacts of the program. Second, we did not consider costs that occur outside the thirty-day procedure bundle. Providers may shift costs and procedures outside the predefined period.

Third, we only examined a single direct payments program that was implemented among selected employers. Future research should examine broader implementation of direct payments programs over a longer period. Fourth, although we present descriptive evidence, we did not thoroughly examine the impacts of the program on quality outcomes, which should be considered in future studies. Finally, our results focus on financial benefits to employers and patients. We did not consider the impacts among providers, both those who elected to participate as a way of retaining and increasing procedure volume and those who potentially lost patient volume for high-margin procedures as a result of the program. Future studies should examine delivery system responses to these types of programs.

Study Results

STUDY POPULATION The direct payments program evaluated in this study was implemented by self-insured employers in a diverse group of industries, including state and local governments, transportation, warehousing, and services, with a range of employee populations from fewer than 1,000 to more than 100,000 people. The study population had 2,372 procedures, and similar patient characteristics were observed before and after implementation (appendix exhibit 3).[23]

EPISODE COSTS AND PATIENT COST SHARING Exhibit 1 describes variation in prices between episodes for three surgical procedures before and after implementation of the direct payments program, with the latter stratified by program participation status. Before implementation, mean episode prices for spinal fusion, joint replacement, and bariatric surgery were $98,944, $38,498, and $29,225, respectively. After implementation and relative to procedures performed outside the program, the mean prices negotiated through the direct payments program ranged from a $29,164 difference (29.1 percent relative difference) for spinal fusion surgery to a $7,143 difference (18.4 percent relative difference) for joint replacement surgery and to a $1,600 difference (6.0 percent relative difference) for bariatric surgery. After implementation, 23 percent of spinal fusion, 16 percent of joint replacement, and 30 percent of bariatric procedures were administered through the program.

Implementation of the direct payments program was also associated with reductions in price variation. For the non–direct payment episodes, the ratio of the seventy-fifth and twenty-fifth price percentiles ranged from 1.9 ($60,281 absolute difference) to 3.2 ($95,285 absolute difference) for spinal fusion surgery before and after implementation, respectively. For joint replacement, the ratio among the non–direct payment procedures was 1.6 in both the pre- and postimplementation periods, an approximately $16,500 difference, and for bariatric surgery, the ratio was 1.5 in both periods, an approximately $10,000 difference. In contrast, among the direct payment procedures, the seventy-fifth to twenty-fifth price percentile ra-

EXHIBIT 1

Distribution of prices between direct payment and non–direct payment episodes for three surgical procedures in a commercially insured population, 2016–20

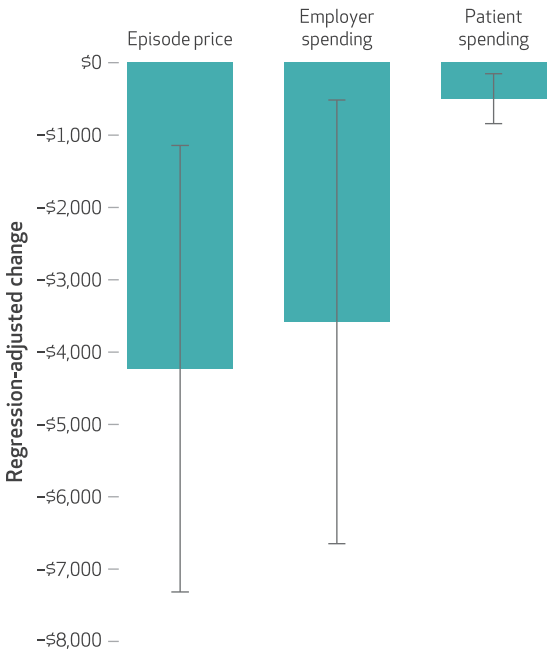
Procedures and populations	Mean	Standard deviation	25th percentile	50th percentile	75th percentile	Ratio of 75th to 25th percentile	Postlaunch direct payment procedures
SPINAL FUSION							
Preimplementation	$ 98,944	51,927	$65,818	$93,091	$126,099	1.9	—[a]
Postimplementation, non–direct payment	100,178	57,083	43,700	88,544	138,985	3.2	—[a]
Postimplementation, direct payment	71,014	1,495	70,418	71,007	72,332	1.0	23%
MAJOR JOINT REPLACEMENT							
Preimplementation	38,498	18,189	27,440	34,385	44,766	1.6	—[a]
Postimplementation, non–direct payment	38,821	18,601	27,573	35,056	43,792	1.6	—[a]
Postimplementation, direct payment	31,678	5,716	29,236	30,914	33,038	1.1	16
BARIATRIC SURGERY							
Preimplementation	29,225	18,612	20,976	25,355	31,348	1.5	—[a]
Postimplementation, non–direct payment	26,509	15,130	19,431	23,072	28,526	1.5	—[a]
Postimplementation, direct payment	24,909	1,595	24,002	25,082	25,958	1.1	30

SOURCE Authors' analysis of commercial claims data for spinal fusion, joint replacement, and bariatric surgery procedures. [a]Not applicable.

tios were 1.0 ($1,914 absolute difference) for spinal fusion, 1.1 ($3,802 absolute difference) for joint replacement, and 1.1 ($1,956 absolute difference) for bariatric surgery. This more compressed variation in prices underscores the potential savings from shifting patients from high-price to lower-price providers.

EXHIBIT 2

Regression-adjusted change in episode prices, employer-paid amounts, and patient cost-sharing payments after employers' implementation of a direct payments program, in absolute dollar terms, 2016–20



SOURCE Authors' analysis of commercial claims data for spinal fusion, joint replacement, and bariatric surgery procedures, 2016–20. **NOTE** The whiskers indicate 95% confidence intervals.

Patient cost sharing for non–direct payment procedures ranged from $2,387 for spinal fusion surgery before implementation to $998 for non-bundled bariatric surgery after implementation (appendix exhibit 4).[23] Patient cost sharing was $0 for all episodes administered by the direct payments program.

Exhibits 2 and 3 present the regression results that measure the association between implementation of the direct payments program and episode prices, payments made by employers, and patient cost-sharing payments in absolute dollars (exhibit 2) and relative percentage change (exhibit 3) for the three surgical procedures. Full regression results are in appendix exhibit 5.[23] Implementation of the program was associated with a $4,229 reduction in episode prices for the three procedures. The majority of the reduction, approximately 85 percent, goes to employers. After implementation, employer payments decreased by $3,582, whereas patient payments decreased by $498. However, in relative terms (exhibit 3), the largest percentage reduction was experienced by patients. In relative terms, patient cost-sharing payments declined by 27.7 percent, per episode prices by a relative 10.7 percent, and employer payments by 9.5 percent.

Exhibit 4 presents the event study regression results that examine the differences in episode prices in the years before and after program implementation. Relative to the year before implementation, regression-adjusted episode prices were higher in the period two or more years before implementation. After implementation, regression-adjusted prices decreased by $4,402

in the first year after implementation and decreased by $6,225 ($p = 0.08$) in the second and greater years of implementation. Similar trends were observed for employer payments (appendix exhibit 8),[23] where we observed a reduction of $3,712 in the first year after implementation and a reduction of $5,963 ($p = 0.09$) in the second and greater years. For patient cost sharing, we observed a $499 reduction in the first year after implementation and a $550 reduction ($p = 0.17$) in the second and greater years (appendix exhibit 8).[23]

SENSITIVITY ANALYSIS We observed similar results when using linear regression models (appendix exhibit 6)[23] and when not including patient-level covariates (appendix exhibit 7),[23] which suggests that model choice and patient-level unobserved characteristics might not have confounded our results. For each procedure, unadjusted readmission rates were lower between those of the selected providers and national readmission rates (appendix exhibit 9).[23]

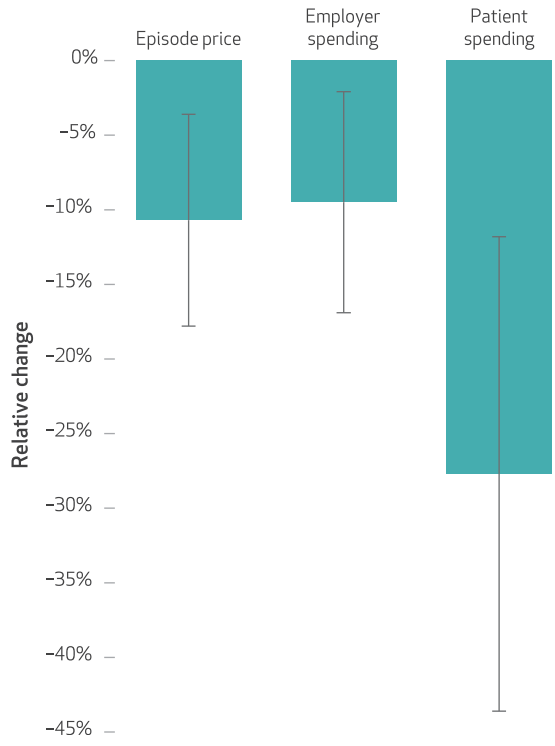
Discussion

High and variable prices among the commercially insured population create a potential opportunity for savings by shifting patient demand from high-price to lower-price providers of similarly high quality. Purchasers are now looking to innovative approaches to encourage their enrollees to receive care from lower-price providers. This follows efforts by the Medicare program to adopt bundled payment programs for high-cost surgical procedures and thereby hold providers accountable for controlling both surgical and postoperative costs. Commercially insured direct payment models that leverage bundled payment structures can likewise harness the same underlying provider incentive improvements and may even further reduce spending as a result of the wide degree of price variation among commercially insured populations at baseline.

In this study we found that the adoption of a direct payments program among a privately insured population was associated with a meaningful $4,229 (10.7 percent) reduction in procedure prices for three high-cost procedures, which was allocated to reductions in both employer ($3,582, 9.5 percent) and patient ($498, 27.7 percent) costs. The impacts of the program increased over time, potentially as both patients and providers learned about the program. Under the direct payments program that we studied, employers waived cost-sharing requirements for patients as a way to change patients' choice of providers. Because employers bear the largest portion of costs, employers effectively received an approximately 700 percent return on waived cost-sharing payments. At the same time, employer health care spending is passed to employees in the form of lower wages and less generous health benefits.[40] Lower employer spending could improve employee well-being if it results in higher wages or more generous health benefits.

EXHIBIT 3

Relative change in episode prices, employer-paid amounts, and patient cost-sharing payments after employers' implementation of a direct payments program, in relative percentage terms, 2016–20



SOURCE Authors' analysis of commercial claims data for spinal fusion, joint replacement, and bariatric surgery procedures, 2016–20. **NOTE** The whiskers indicate 95% confidence intervals.

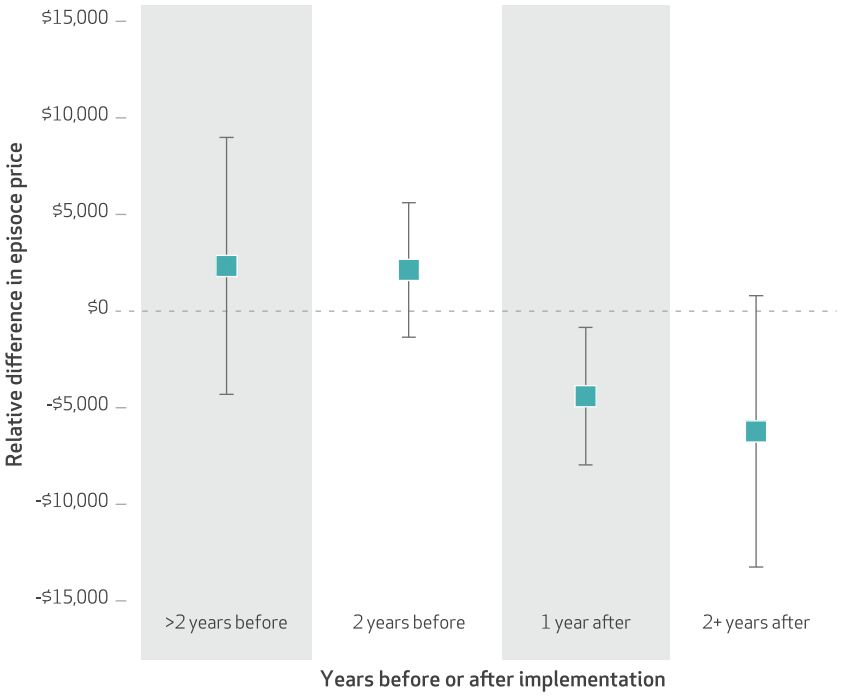
As employers and other health care purchasers seek to restrain health care spending, it is worth putting these estimates in the context of other approaches implemented among employer plans. These results compare similarly to evaluations of reference pricing programs implemented by employers and payers as a way to steer patients to lower-price providers.[18,19] For example, a previous evaluation of the reference pricing program implemented by the California Public Employees' Retirement System for joint replacement surgeries found a 13.2 percent reduction in procedure prices, which is similar to our estimated reduction.[41] However, the direct payments program that our study examined has the advantage of waiving patient cost sharing, whereas other studies have observed in-

creases in patient cost sharing after the implementation of reference pricing. Relatedly, a fear of patient disruption can be a barrier to employers and payers adopting reference pricing.[18,42–44] Our results can also be compared with centers of excellence, where payers similarly direct patients to preferred providers. In an evaluation of one center-of-excellence program, implementation of a center of excellence was associated with reduced joint replacement procedures, although per procedure payments did not change.[45]

Bundled payment is gaining popularity in the Medicare system. However, the wide variation in prices among the commercially insured population presents a meaningful opportunity to use similar incentive structures to move patients toward lower-price providers. Our results demonstrate that direct payments programs that use bundled payment mechanisms can have financial benefits for employers and patients. Whether these results remain localized to a small number of "big ticket" procedures or expand to broader patient populations and procedure types remains to be seen. An open question with this evaluation and other similar evaluations is the indirect impacts on wages and other benefits. As purchasers redesign their benefits to reduce health care costs, there should be a corresponding increase in wages and other benefits. Future work should examine these more comprehensive effects. ■

EXHIBIT 4

Regression-adjusted trends in episode prices relative to the number of years before or after employers' implementation of a direct payments program, 2016–20



SOURCE Authors' analysis of commercial claims data for spinal fusion, joint replacement, and bariatric surgery procedures, 2016–20. **NOTES** This exhibit presents event study regression results that measure the regression-adjusted differences in per episode prices in the years before and after employers' implementation of a direct payments program. The whiskers indicate 95% confidence intervals.

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