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Association Between Private Equity Acquisition of Urology Practices and Physician Medicare Payments

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OBJECTIVE To assess whether private equity (PE) acquisitions of urology practices were associated with changes in Medicare payments and patient volume.

METHODS We identified PE acquisitions of urology practices through financial databases, industry news outlets, practice websites, and Google search. Using the Centers for Medicare and Medicaid Service's Medicare Provider Utilization and Payment Data: Physician and Other Supplier Public Use File (2012-2019), we conducted descriptive statistics and trends analysis to examine whether PE acquisition was associated with changes in Medicare payments and patient volume in comparison to non-PE affiliated urologists within the same states.

RESULTS We identified PE acquisitions of 10 independent urology practices across 6 states during the study period. In the preacquisition period, urologists later joining private-equity groups received greater mean inflation-adjusted Medicare payments ($246,977 vs $160,038; P <.001) and had greater patient volume (839.7 vs 674.2 patients; P = .001) than urologists who did not. In the postacquisition period, PE affiliated urologists had an 11.0% (95% CI: -0.2% to 22.3%) increase in inflation-adjusted Medicare payments (P = .054) and a 12.5% (95% CI: 6.5%-18.6%) increase in patient volume (P <.001). Non-PE affiliated urologists exhibited a 6% decline in Medicare payments (P <.001) and a 2.7% increase in patient volume (P <.001).

CONCLUSION PE affiliated urologists exhibited increases in Medicare payments even prior to acquisition, in contrast to declines for geographically similar, non-PE urologists. These findings may highlight characteristics of practices targeted by PE firms and local practice trends that may further diverge following acquisition. UROLOGY 167: 121–127, 2022. © 2022 Elsevier Inc.

The impact of recent increasing private equity (PE) acquisitions of urology practices is unknown.[1] Following successful investments in ophthalmology and dermatology, PE firms began acquiring urology practices in 2016 through the formation of platform companies, mechanisms that provide legal separation between a physician practice and a PE-firm controlled management organization.[2] As of March 2021, 5 PE-backed platform companies are estimated to employ a small but significant proportion of the urology workforce.[2] Through focused acquisitions, PE-backed urology platforms have achieved regional market influence, and are now estimated to employ over a quarter of the private practice workforce in New Jersey and Maryland.[2] PE firms typically have an investment horizon of 3 to 7 years, during which they institute operational improvements, reduce costs, and raise revenue to increase the valuation of the acquired practices for sale to a strategic buyer such as a health system, insurer, or other PE firm.[3-5] PE investment in dermatology practices has been associated with increased clinical volume and higher prices for commercial insurers following acquisition, highlighting potential operational changes that may occur following acquisition.[6]

Given rapid changes within certain healthcare markets, we sought to understand whether PE acquisition of urology practices has been associated with increases in volume and change of focus towards higher revenue services in the Medicare population.[7] Large PE-backed platform practices have the potential to generate scale efficiencies and benefit from large referral networks, providing a strategic advantage over smaller, independent practices. Thus, we further aimed to understand whether PE acquisitions negatively impacted the revenue and volume of surrounding urology practices that were not acquired by PE companies.

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METHODS

Claims Data

The primary data source was the Medicare Provider Utilization and Payment Data: Physician and Other Supplier Public Use File, which contains 100% of the line items for Medicare Part B fee-for-service population from 2012 to 2018 and includes identifying provider information and data on utilization and payment for each healthcare common procedure coding system (HCPCS) code.[8] This dataset has been used previously to examine variations in physician charges across specialties as well as variability in Medicare utilization among urologists.[9,10]

PE Acquisitions. To align with the availability of Medicare data, we focused on acquisitions occurring between January 1, 2013 through December 31, 2018. Using a previously defined algorithm, we identified urology practice acquisitions by PE firms occurring from January 1, 2013 to December 31, 2018 by searching S&P Capital IQ, Pitchbook, CB Insights, PR Newswire, and The Business Journals.[2,11-15] We identified the date of the transaction, the names of the acquiring platform company and PE firm, the name of the acquired practice, and the name of the urologists involved.[2] To ascertain employment history throughout the study period, we cross-referenced present-day practice website employment rosters against the names and addresses listed in the Medicare database. We used billing addresses corresponding to PE-affiliated practices to identify previously employed urologists. To ensure accuracy, identified physicians were then validated against practice website archives and google keyword search.

Study Variables. For each provider, we totaled submitted Medicare charges and payments across all HCPCS codes, including both office and facility payments, for each calendar year. Payments were calculated as the amount paid by Medicare after deductions and coinsurance amounts were subtracted. Given the length of the study period, dollar values were adjusted for inflation to correspond to 2019 values using the consumer price index.[16]

The charge-to-Medicare allowable amount ratio (CMAA ratio) was determined by dividing submitted charges by the Medicare allowable amount, the geographically adjusted value that Medicare deems reasonable to pay for a service.[9] A greater CMAA ratio may represent higher cost, greater physician market power, or cost-shifting to recoup underpayment from Medicare from higher-paying private insurers.[17] To estimate patient volume, we calculated the number of total Medicare patient visits by summing the number of unique patients for the following HCPCS codes: 99201, 99202, 99203, 99204, and 99205 for new patients; 99211, 99212, 99213, 99214, and 99215 for return patients.[10] We excluded payments to radiation oncologists or pathologists due to the lack of specificity for urologic services.

Statistical Analysis. To analyze the effect of PE acquisition, we compared Medicare payments and patient volume corresponding to time periods relative to the year of acquisition. For PE affiliated practices, the preacquisition period was defined as time-period preceding the year of acquisition, with a washout period in the calendar year of acquisition to account for variation in practice resulting from transition in ownership. Similarly, the postacquisition period for PE-affiliated practices was defined as the period following the year of acquisition.

To analyze regional market effects and account for regional differences in practice, we limited analysis of non-PE affiliated practices to practices located in states in which PE acquisitions occurred during the study period. For non-PE affiliated practices, the preacquisition, washout, and postacquisition periods were established to correspond to the year with largest PE acquisition within that state by number of urologists. Given the availability of data, the postacquisition period was limited to 2 years. We excluded urologists with less than 1 year of preacquisition and postacquisition data within the same state due to account for residency and fellowship training periods, relocation, and retirement.

Differences between PE-affiliated and non-PE-affiliated practices and across acquisition periods were examined using descriptive statistics and Student's t-tests. To assess whether PE acquisition was temporally associated with changes in Medicare payments and patient volume, we first evaluated whether trajectories were similar in the period prior to PE acquisition. This test of the parallel trends assumption assessed the suitability of difference-in-differences (DID) analysis.[18] Lastly, we compared mean annual payments for PE and non-PE urologists by HCPCS code in both the pre- and postacquisition period, focusing on the 10 codes with the largest magnitude difference in payment per urologist between the two groups. We estimated average urologist volume by dividing mean total payments by the average Medicare standard amount corresponding to each code for the respective period. We excluded HCPCS codes that were not billed by at least 1 PE and 1 non-PE provider. Statistical analysis was conducted using Stata/IC 17.0 (College Station, TX). Statistical significance was defined as a *P*-value of less than .05. This study was deemed exempt from the principal investigator's institutional review board (IRB).

RESULTS

Acquisition of Urology Practices

We identified acquisitions of 10 independent urology practices conducted by 3 PE firms occurring between 2016 and 2018.[19] The acquisitions occurred in Maryland, Delaware, Tennessee, Colorado, New Jersey, and Ohio, with 1 PE firm acquiring practices across noncontiguous states.[2]

Pre- and Postacquisition Comparison

We identified 233 PE and 2,995 non-PE employed physicians who met the study criteria. Preacquisition, PE-employed urologists submitted $890,183 ± $744,346 in inflation-adjusted mean Medicare FFS charges annually and received inflation-adjusted mean payments of $246,977 ± $194,714, compared to non-PE employed urologists who submitted inflation-adjusted mean charges of $572,305 ± $576,091 (*P* <.001; Table 1, Fig. 1) and received $160,038 ± $144,584 in inflation-adjusted mean payments (*P* <.001). In the preacquisition period, PE-employed physicians had a CMAA ratio of 2.67, whereas non-PE employed urologists had a CMAA ratio of 2.78 (*P* = .004).[9] PE employed urologists saw 839.7 ± 381.6 unique Medicare patients annually compared to 674.2 ± 400.9 for non-PE employed urologists (*P* < .001). PE-employed urologists received $299 ± $207 in inflation-adjusted mean annual payment per patient while non-PE-employed urologists received $242 ± $157 (*P* <.001).

Postacquisition, PE-employed urologists submitted $942,897 ± $719,579 in annual inflation-adjusted mean Medicare charges (absolute change (AC): $52,714; relative change (RC): 5.9%, 95% CI: -5.1% to 16.9%; *P* = .290) and received inflation-

Table 1. Payment, volume, and payment/patient of urologists before and after PE acquisition

	Preacquisition		Postacquisition	
Measures	PE	Non- PE	PE	Non- PE
Number of Urologists	232	2971	201	2812
Annual payment	$246,977 ± $194,714	$160,038 ± $144,584	$274,221 ± $269,932	$150,452 ± $133,528
Patient volume	839.7 ± 381.6	674.2 ± 400.9	945.1 ± 328.4	692.3 ± 400.1
Payment / patient	$299 ± $207	$242 ± $157	$$303 ± $315	$222 ± $135
Charge-to-medicare allowable amount	2.67	2.78	2.76	3.04

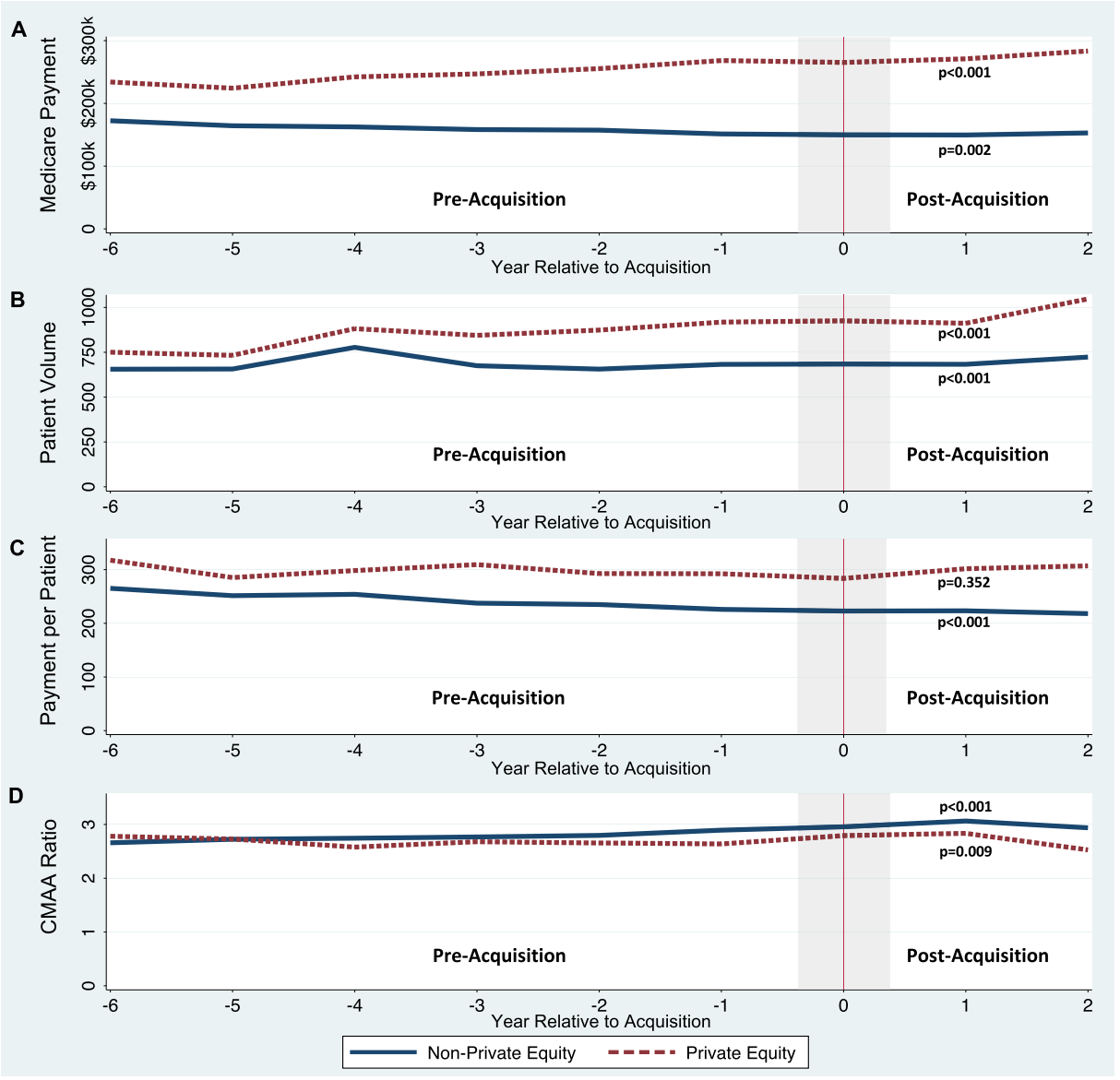

Figure 1. Annual trends among private equity (PE) and non-PE urologists for total Medicare payments (A), Medicare patient volume (B), Medicare payment per patient (C), and charge-to-Medicare allowable amount (CMAA) ratio (D) for the time periods prior to and after PE acquisition. (Color version available online.)

adjusted mean payments of $274,221 ± $269,932 (AC: $ 27,244; RC: 11.0%, 95% CI: -0.2% to 22.3%; $P = .054$). By comparison, non-PE-employed urologists submitted annual inflation-adjusted mean charges of $586,887 ± $567,737 (AC: $14,582; RC: 2.5%, 95% CI: -1.1% to 6.2%; $P = .170$) and received $150,452 ± $133,528 (AC: -$9,586; RC: -6.0%, 95% CI: 2.8%-9.2%; $P < .001$) ($P < .001$) (Table 1). Postacquisition, PE-employed urologists had a CMAA ratio of 2.76 (AC: 0.09; RC: 3.3%, 95% CI: -1.6% to 8.2%; $P = .190$) whereas non-PE-employed urologists had a CMAA ratio of 3.04 (AC: 0.26; RC:

9.4%, 95% CI: 7.0%-11.0%; P <.001) (P = .002). PE-employed urologists saw a mean of 945.1 ± 328.4 unique Medicare patients annually postacquisition (AC: 105.4; RC:12.5%, 95% CI: 6.5%-18.6%; P < .001), compared to 692.3 ± 400.1 for non-PE-employed urologists (AC: 18.1; RC: 2.7%, 95% CI: 0.4%-4.9%; P = .0198) (P <.001). PE-employed urologists received an inflation-adjusted mean of $303 ± $315 per patient postacquisition (AC: $4; RC: 1.3%, 95% CI: -9.4% to 12.0%; P = .813) while non-PE-employed urologists received $222 ± $135 (AC: -$20; RC: -8.1%, 95% CI: -10.5% to -5.7%; P <.001). Supplemental Table 1 includes year-by-year analysis for the variables described above.

Trend Analysis

There was a trend of increasing inflation-adjusted revenue among PE-affiliated urologists over the study period, whereas non-PE-affiliated urologists exhibited a persistent decline (Fig. 1A; Supplemental Table 1). PE-affiliated urologists persistently maintain greater Medicare patient volume, with the gap widening across the study period (Fig. 1B). In terms of inflation-adjusted payment per patient, PE-affiliated urologists maintained a relatively flat trend, whereas non-PE-affiliated urologists show a steady decline throughout the study period (Fig. 1C). PE-affiliated urologists initially demonstrated greater a CMAA ratio at the beginning of the study period, but from the fourth year prior to acquisition, PE-affiliated urologists persistently had lower CMAA ratios (Fig. 1D). Tests of parallel trends showed diverging trends of annual inflation-adjusted Medicare payments (P <.001), patient volume (P <.001), inflation-adjusted payment per patient (P <.001), and CMAA ratio (P <.001) in the period prior to PE acquisition (Fig. 1). Thus, we did not estimate the effect of PE acquisition on payments, volume, and CMAA ratios using difference-in-differences analysis.

Differences by HCPCS Code

In comparing the 10 HCPCS codes with the largest magnitude difference in mean payment for PE and non-PE-employed urologists, 4 of the top 10 codes remained the same between the pre- and postacquisition periods (Table 2). For the 6 new HCPCS codes, the mean Medicare standard amount (standard payment) was $785, compared to $233 for the 6 codes they replaced. The magnitude of difference in payments and volume between PE and non-PE urologists doubled for CPT codes 52315 (Complex removal of foreign body from urethra or bladder) and 99,213 (established patient visit − 15 minutes) in the postacquisition period. The difference declined 40.3% for CPT 99214 (established patient visit − 25 minutes). In the postacquisition period, PE-affiliated urologists saw 768% ± 2% greater volume for CPT 52315 (complex removal of foreign body from urethra or bladder), 309% ± 32% increase in CPT 51990 (suture suspension of urethra), 185% ± 3% greater for CPT 50081 (removal/crushing kidney stone >2cm), and 155%±4% greater for CPT 55899 (male genital system procedure).

COMMENT

We studied the association between PE acquisition and urologist Medicare FFS payments and patient volume. We found that urologists in practices later acquired by PE firms had ∼50% greater inflation-adjusted Medicare revenue and ∼25% greater patient volume in the preacquisition period compared to non-PE-affiliated urologists. In the postacquisition period, PE-affiliated urologists had an 11.0% increase in inflation-adjusted Medicare payments and a 12.5% increase in patient volume. In comparison, non-PE-affiliated urologists experienced a 6.0% decline in inflation-adjusted Medicare payments and 2.7% increase in patient volume. In addition to increased patient volume, our findings also suggest that differences may be contributed, in part, by greater use of higher reimbursement outpatient services. Taken together, these findings highlight baseline differences in practice type, including revenue and patient volume, which may suggest characteristics associated with PE acquisition. Of note, we observed diverging trends of Medicare payment and volume between PE-affiliated and non-PE-affiliated urologists prior to acquisition, which continued postacquisition. These findings suggest that patterns of payment and volume cannot necessarily be attributed to the effects of PE acquisition, but may reflect market trends that influenced acquisition.[18,20] These findings may foreshadow future trends of PE acquisitions of urology practices, notably increasing disparities in revenue and volume between PE and non-PE affiliated practices as the scope and scale of PE platforms increase.[20] In light of increasing national PE investment in urology practices, these findings raise timely questions about opportunities and challenges and associated with new ownership structures as well as the quality and value of care delivered.

We found that PE and non-PE affiliated practices differed significantly in payments and clinical volume prior to acquisition, with the increasing gaps in the years preceding acquisition. These results might suggest that PE-firms were preferentially directed at high-revenue practices with demonstrated potential for further growth. Although internal strategic considerations were not available for this analysis, prior horizontal and vertical consolidations in many of the PE targets may have allowed practices to develop geographic market power and economies of scale prior to investment.[2,21] Where PE acquisition differs from prior consolidations is in the sheer magnitude of capital available, which has given rise to the development of practices of unprecedented scale.[1,2,20] The juxtaposition of continued revenue and volume expansion for PE-affiliated urologists against contraction in geographically similar, non-PE-affiliated urologists may reflect the improved efficiencies of the consolidated practice model.[4] Operational differences such as centralization of administrative tasks and greater utilization of advanced practice providers (APPs) may allow urologists in consolidated and subsequently, PE-acquired groups, to focus more time on clinical work and on higher value procedures.[21] However, the continued increases may also reflect explicit strategies to increase clinical productivity.[3,22]

Nonparallel trends in the period prior to acquisition suggest that differences in payment and volume cannot necessarily be attributed to the effects of PE acquisition. Diverging secular trends may exist between urologists practicing in different settings. However, it is possible that differentials will scale with PE platforms, some of which

Table 2. Ten HCPCS codes with the biggest differential in mean total payment per urologist between PE and non-PE urologists in the pre- and postacquisition periods. Codes highlighted in red are present in both periods

Procedure	HCPCS Code	D Mean Total Payment	Medicare Standard Amount*	Non-PE Annual Volume	PE Annual Volume	D Volume
Pre-acquisition						
Sipuleucel-t infusion	Q2043	$ 162,210	$ 30,389	32.0	37.3	17%
Complex removal of foreign body from urethra or bladder	52315	$ 32,993	$ 317	27.4	131.4	380%
Cystourethroscopy, with bladder dilation	52265	$ 19,200	$ 287	59.7	126.6	112%
Unclassified drugs	J3490	$ 18,908	$ 434	65.9	109.4	66%
Established patient visit (25 min)	99214	$ 13,751	$ 81	325.7	496.3	52%
Cystourethroscopy for female urethral syndrome	52285	$ 9,921	$ 200	49.6	99.3	100%
Endscopic suture suspension of urethra	51990	$ 7,708	$ 327	21.7	45.3	109%
Established patient visit (15 min)	99213	$ 5,126	$ 53	492.2	588.5	20%
Diagnostic cystoscopy/ urethroscopy	52000	$ 4,974	$ 139	47.8	83.6	75%
Injection, denosumab, 1 mg	J0897	$ 4,900	$ 13	4378.7	4759.7	9%
Postacquisition						
Sipuleucel-t infusion	Q2043	$ 143,813	$ 33,917	33.8	38.0	13%
Complex removal of foreign body from urethra or bladder	52315	$ 69,306	$ 310	29.1	253.0	768%
Removal/crushing kidney stone >2 cm	50081	$ 47,388	$ 956	26.8	76.3	185%
Suture suspension of urethra	51990	$ 25,191	$ 311	26.2	107.3	309%
Established patient visit (15 min)	99213	$ 9,565	$ 50	475.7	666.1	40%
Insertion of sacral nerve neurostimulator	64561	$ 9,301	$ 578	25.1	41.2	64%
Injection of biodegradable material next to prostate	55874	$ 8,895	$ 1,746	36.9	42.0	14%
Male genital system procedure	55899	$ 8,423	$ 581	9.4	23.9	155%
Established patient visit (25 min)	99214	$ 8,206	$ 76	342.6	450.4	31%
Incision for insertion of sacral nerve neurostimulator	64581	$ 7,390	$ 538	17.7	31.4	78%

have achieved multi-state presence via add-on acquisitions and mergers.[2] As a result, PE business strategy may result in the development of significant geographic market power and economies of scale that pose competitive challenges for smaller, neighboring practices.[2,3,23] As providers have discretion to set charges, the lower Medicare charges (CMAA) exhibited by PE-affiliated urologists may represent lower cost resulting from improved efficiency of care in a consolidated model.[9] However, a lower CMAA may also reflect a reduced need to cost-shift, in which providers attempt to recoup underpayment from public payers in higher prices to commercial payers, due to a higher proportion of commercially insured patients.[6,17] We have previously shown that PE-backed urology practices have lower rates of Medicaid acceptance compared to non-PE practices, however, further examination of payer mix is needed to elucidate the drivers behind differences in CMAA ratio.[24]

This study has several limitations. While our analysis captured 100% of the known PE acquisitions of urology practices occurring within the study period, it was limited to 10 PE-affiliated practices across 6 states. While some of these practices accounted for significant regional workforce share in line with the expectations of a PE business model, the size of the sample limits the generalizability of this work, particularly with respect to future acquisitions which may operate within distinct market conditions. In addition, while we can examine revenue with Medicare data, payment does not necessarily equate to profit, though it provides a rough proxy of financial performance.[10] Furthermore, the data is not completely representative of any urologist's practice, which also includes other payors. For example, it is possible that differences in Medicare payment and volume were offset by a greater share of commercially insured patients. A wider scoped analysis including a broader payor mix may clarify trends in payment and clinical volume. Further, as the Medicare dataset does not include the indication for the HCPCS code, so we were unable to distinguish urology specific billing for provider which limited our ability to account for ancillary services such as radiation oncology, imaging and pathology which may be major revenue sources. In addition, we were unable to specifically assess direct Medicare billing by APPs given the limited data available on employment history, especially among non-PE APPs.[22] Lastly, this dataset did not provide patient clinical or sociodemographic information, limiting our ability to evaluate trends at the patient level. Nonetheless, these findings

provide new, timely information about changing practice patterns within urologic care delivery.

CONCLUSION

This study provides the first analysis of Medicare payments and patient volume in the time-period surrounding PE acquisition of urology practices. We found that prior to PE consolidation, urologists employed by groups eventually acquired by PE firms had higher mean Medicare payments and patient volume relative to urologists whose practices were not acquired. Following acquisition, PE-employed urologists saw an increases in Medicare payments and patient volume, whereas non-PE employed urologists saw relative decreases. Diverging trends in the period prior to acquisition suggest that differences are not necessarily reflective of the effects of PE acquisition and may reflect underlying trends between these 2 groups set into motion prior to consolidation. These findings have significant implications for the future private urologic practice as trends in PE acquisition continue and platforms increase in size. Future research can assess the impact of PE acquisition on cost for commercial insurers as PE platforms consolidate market power as well as downstream effects on healthcare access, quality of care, and physician autonomy.

SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at https://doi.org/10.1016/j.urology.2022.03.045.

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EDITORIAL COMMENT

A striking feature of the healthcare landscape over the last decade has been the steady increase in physician practice consolidation.[1,2] This has included independent practices merging to form larger ones, in addition to hospitals, health systems and large health insurers acquiring physician practices. Such consolidation is believed to be a response to an increasingly complex regulatory environment and attempts to maximize profits in the context of shrinking reimbursements. An interesting recent twist to this trend is the acquisition of physician practices by private equity (PE) firms. In such cases, firms typically purchase a majority ownership stake in large practices, using invested funds to reorganize the practice (absorbing smaller practices, using economies of scale to maximize cost efficiency, developing and expanding profitable service lines) with the intention of generating substantial returns over a short time horizon of 3-7 years.[3] In a national study examining a range of specialties, from 2013 to 2016, there were 355 practice acquisitions by PE, with a doubling of the annual number of acquisitions over the period.[4] On this background, Nie et al provide the first description of changes in practice patterns following PE acquisition of urology practices.

Using a combination of financial databases and internet website searches, the authors identified a set of PE transactions by 3 firms from 2016 to 2018, acquiring 10 urology practices across 6 states, and involving 233 urologists. They used a set of control urologists in practices drawn from the same states but not acquired by PE. Using Medicare claims, they show that patient volume and spending increased 12.5% and 11%, respectively, in the year following the year of acquisition in PE practices, in contrast to only a 2.7% increase and a decline of 6%, respectively, among control practices. Notably though, there were already substantial differences in patient volumes and spending between

the groups in the year *prior* to acquisition, and in fact the trajectory over the years preceding acquisition was also significantly different for the PE practices, precluding a formal difference-in-differences analysis. The implication is that the acquired practices may have been chosen for their characteristics and trajectory, making it unclear whether changes following acquisition were influenced by PE management or simply reflect continuation of the existing practice trends. In future work, discerning the impact of PE will require careful selection of comparable control practices and longer follow-up postacquisition.

Although this work is of substantial interest as a preliminary foray into the potential effects of PE in the urology practice market, important questions remain. Chief among these is its influence on quality of care. The overt profit maximization intrinsic to this model could lead to reduced access to important but low-cost (ie, low profit) services, or to overuse of low value but high profit services. To date, the evidence base is extremely limited, although some concerns have already been raised in other clinical contexts.[5] This rapidly burgeoning trend will need to be closely monitored for its impact on urological care.

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AUTHOR REPLY

We appreciate the insightful comments and agree that understanding the impact of PE acquisitions on cost, utilization, and quality in urology is critical. It may take years for these assessments to fully mature. In the interim, analyses in other similar healthcare industries have found reasons for both caution and optimism and suggest that there is no uniform strategy employed by investors. In some instances, strategies to maximize profit can be at odds with priorities for cost-effectiveness and safety. For example, PE investment has been associated with increased costs for commercial insurers in dermatology practices and increased mortality in nursing homes.[1,2] However, consolidation through PE investment, or other means, may provide opportunities for innovation and efficiency that can align financial and clinical incentives.[3] These findings suggest that future analyses should not only examine the phenomenon of practice consolidation but also consider the specific circumstances of the ventures, including the history and priorities of investment partners. Such information may provide a higher level of detail about characteristics of successful partnerships that may be valuable to urologists and healthcare systems.

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