



Private equity and its effect on patients: a window into the future

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Private Equity (PE) has grown rapidly in the last two decades totaling \$750 billion over the 2010–2019 period [1]. Total PE investment in the healthcare industry has increased 20-fold from \$5 billion annually in 2000 to \$100 billion in 2018, with annual transactions growing from 78 to 855 within the same period [2]. This pace will likely accelerate post pandemic as there is a significant amount of unspent capital (dry powder) that is expected to be invested in healthcare.

Reasons for private equity growth

Several reasons are behind the growth of PE including the fragmented delivery of care, the recession resistant nature of healthcare, inefficiencies in healthcare delivery, prevalent third-party payment and an aging population with the prevalence of chronic disease [3]. PE sees new opportunities for investment in such a setting through its ability to consolidate a fragmented market and strive for economies of scale, reduce resource waste through efficient cost cutting measures, meet the growing demand for healthcare services among those with chronic disease and the elderly and profit from third party payers with high valuations regardless of a turbulent economy. Taken together, PE appears to be a good match to meet the current needs of healthcare.

For physician owners considering selling, a PE acquisition can offer physicians relief from management responsibilities and allow them to focus on patient care, while having minority ownership of the practice. Independent practices that find it difficult to compete in an increasingly consolidated market along with new requirements and the increasing uncertainty due to the shift toward value-based purchasing, PE offers a chance to unload the financial and administrative responsibilities while making a profitable sale taxed at favor-

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able capital gains rates [4]. In addition, the infusion of capital, the upgrade of health information technology, cost cutting strategies, enhanced revenue cycle management, continued partial ownership of the practice are additionally appealing features that will enhance their practice.

Similarly, hospitals that are in financial distress stand to gain from PE acquisitions through immediate access to resources and the infusion of capital [5]. Hospitals operating on razor thin margins have faced unprecedented financial challenges during the pandemic from loss of revenue and will look for financial stability through PE acquisitions [6].

The private equity model: a brief overview

In a typical acquisition by private equity, 70% of the overall cost is financed by debt and the remaining 30% equity stake is funded through limited partners (e.g. endowments, pension funds, wealthy individuals), who expect an annual return of 20% or more. The PE firm which manages the business usually funds 2% of the overall equity stake. Usually, the PE firm will exit the investment within 3–7 years from the time of acquisition and usually keep 20% profit from the sale of the entity with the rest going to the limited partners. The typical investment model that PE uses in acquiring healthcare entities is the leverage buyout (LBO), where the PE firm pledges the targets assets as collateral for the debt to finance the purchase. Notably, it is the acquired entity that bears the responsibility of paying the debt.

PE investment in physician practices typically follows a “platform and add on” approach in which the PE firm first purchases a sizable established group practice and then acquires additional small practices to build market power, economies of scale, capture a stream of referrals and demand higher rates from commercial payers. Acquisition prices are based on EBITDA (earnings before interest, taxes, depreciation and amortization), which is a proxy for operating cash flow. Smaller acquisitions are purchased at 2–4 X EBITDA, while platform practices are purchased at 8–12x EBITDA. Once the practices are merged, the smaller practice’s valuation increases and becomes that of the larger practice (8–12x EBITDA).

PE may use the platform model in the same geographic market or across several regions to become a large company with a national presence. Under the platform model, the PE firm creates a new management service organization to operate the business aspects of the practice. Once the initial PE investor has grown the company, it will sell it to another investor at a higher multiple of EBITDA. There are often large practice efficiency gains with the first buyer through inventory maintenance and IT systems. However, a subsequent buyer looking to further double the investment may need to make drastic changes to staffing and compensation and increase productivity if they are focused on augmenting value and increasing profit through consolidation, cost reduction and revenue generation.

Private equity and the cause for concern

Proponents of PE argue that the firm provides capital and management expertise to improve quality and clinical standards and billing systems. On the other hand, the short-term focus on revenue, and outsized return on investment and cost cutting measures for efficiency are deemed to be concerns in the prioritization of profits over patient care. Physicians have

expressed multiple concerns including the loss of autonomy, the pressure to increase volume and coding intensity, and rely more on physician extenders. Economists have concerns of consolidation and the anticompetitive effects it will have on the healthcare market, which will drive down quality and drive up costs for patients. Additionally, the heavy debt that is placed on the PE acquisition may lead to bankruptcy and affect access to patient care in underserved areas. Finally, the focus on revenue generation may also generate unnecessary procedures and within network referrals which leading to less responsive patterns to patient needs and preferences.

This paper briefly reviews the current evidence on the effect of PE and its three core motifs of consolidation, revenue generation and debt financing through LBOs on patient care. Patient care will be assessed with respect to quality, cost and access in various healthcare settings.

Consolidation: its effect on quality and cost

PE's rollup strategy, where a large platform practice is acquired and additional practices are "added on", gives the firm increased market power in a specialty or geographic region. This is expected to lead to increased efficiency in healthcare delivery, economies of scale and better negotiation of prices with insurers. Concurrently, these accelerated acquisitions have anticompetitive effects making the survival of independent practices more difficult. Ultimately, in such settings, consolidation leads to higher costs and lower quality care. The nursing home setting provides the best example, where consolidation led to lower staff/patient ratios, worse quality metrics, [7, 8] and higher mortality rates to patients despite higher Medicare reimbursement rates (11% higher rates) [9]. Alternatively, this has not been seen in PE institutions that existed in competitive markets, where the incentive for CMS quality metrics remained strong [10]. One study did not demonstrate poorer quality metrics among PE owned nursing homes; [11] however, this discrepancy has been postulated to be from not distinguishing between postacute vs. long-term care nursing, where the former attracts higher reimbursement rates and has better quality metrics and the latter is more reflective of previous studies of long-term facilities [12]. Data from two studies appear to be demonstrate concentration of markets under PE provides leads to lower quality care: the first, a study in the dialysis setting showed that concentrated markets have higher hospitalizations, lower survival and declines in staffing [13] and the second, a study of PE owned hospitals showed fewer full time equivalent employees (FTE) per occupied bed and lower patient satisfaction scores [14].

Not all studies have given cause for concern in the inpatient setting. One study of nursing homes showed similar performance during the COVID 19 pandemic between those that are PE owned and non PE owned; however, the PE owned nursing homes were found to have a lower supply of personal protective equipment [15]. The hospital setting has yielded mixed results, where a seminal study found that the quality of care was higher in PE acquired hospitals. However, the data was driven by hospital corporations of America (HCA), a company with long-term experience in healthcare with a focus on quality metrics. When the HCA hospitals were subtracted from the data, PE owned hospitals performed worse [16].

The result of consolidation is the ability to negotiate higher payments from insurance companies, which is reflected in the amounts charged to insurance companies. This ulti-

mately affects the patient costs as higher charges lead to higher premiums for patients. The seminal works by Bruch and Offodile demonstrated that PE acquisitions lead to higher charge/cost ratios and higher profit margins at PE hospitals [16, 17]. The most concerning aspect of higher premiums is that there is a higher chance of patients not seeking emergent care due to the costs incurred. The outpatient setting also showed a similar trend, where a recent study in dermatology showed increases in prices paid to the dermatologists by 3–5% per routine visit [18].

The most poignant critique of the benefits of consolidation is that the “buy and build” model’s ability to provide economies of scale and increased efficiency has not to be proven in studies [19, 20]. Rather, the addition of practices allows access to larger debt financing and ultimately to a profitable sale of a larger practice that is 8–12x the EBIDTA (taxed at capital gains rates) without providing the supposed benefits of efficiency or improved patient care [1].

Revenue generation and cost cutting: its effect on quality and access

The “buy and build” strategy of PE, which has the intention to double their investment within 3–5 years, depends on two fundamental paths to increase value of the acquisition: (1) increase multiples of EBIDTA through consolidation (2) increase revenue generated through operational measures that cut costs and focus on revenue generating streams [1]. The second mechanism usually involves deliberate operational changes in a PE practice that are implemented towards that end. However, the effect of revenue generation on the quality of healthcare delivery and access to patient care are being studied in multiple specialties including dermatology, gastroenterology, urology, ophthalmology, women’s health, behavioral health and primary care.

The dermatology setting has provided the most evidence in acquired physician practices. The recent study by Braun et al. [18] shows there is an increase in the volume of patients seen by PE owned dermatologists ranging from 4.7 to 17% compared to non-PE owned practices between 2012 and 2017, but no major changes in the volume of procedures (biopsies, Mohs surgeries). There was also a modest increase (3–5%) on prices charged per patient visit. This study has been critiqued that the modest effects noted in the study are because it did not capture a major wave of acquisitions beginning in 2017, nor did it distinguish between platform and add-on purchases (where the latter has more substantial operational changes that occur) [12]. This study also does not include elderly patients from Medicare and Medicare Advantage, which accounts for a large percentage of the procedures. Along with seeing more patients, some dermatologists have expressed concern that PE ownership creates an emphasis on profitability and puts pressure on dermatologists to meet production numbers for procedures, sell products and make in house referrals [21]. Dermatologists have also raised concerns of PE firms providing low value care by hiring physician extenders to work in unsupervised settings to generate additional revenue and perform procedures that are necessary [22]. One of the most alarming examples was in one firm, intralesional injections and skin biopsies were being performed at the bedside at nursing homes by physician extenders where 75% of the patients had Alzheimer’s disease.

Dermatology has seen also an uptick in kickback, self-serving referrals, and aggressive coding of the procedures through ancillary services. Expanding ancillary services is a major

strategy of revenue generation, where lucrative specialists (I.e., Moh's micrographic surgeons, dermatopathologists) are hired to keep referrals inhouse [22]. This model is susceptible to overutilization of procedures through financial incentives for the proceduralist. In such settings dermatologists also have less freedom to make the best referrals in response to the patient's needs. While clearly in violation of Stark Law (prohibiting self-referrals) and the Antikickback Statute (prohibiting incentives for referrals), this self-referring loop has been enabled by exploiting the Stark Law exception for in office ancillary services, which was originally intended for diagnostic tests and patient convenience [3].

The results in ophthalmology clinics have been mixed, where some report little change to patient care, while others report a growing shift to short term profits such as prescribing more expensive drugs through the perverse incentives from Medicare Part B [12, 23]. One study also reported a growing concern by ophthalmologists that optometrists and physician extenders may be used as substitutes in clinical settings that were less clinically appropriate and pressure physicians to generate more revenue through more profitable procedures [23, 24]. Additional studies on the quality of patient care in PE owned ophthalmology practices are needed.

PE owned hospitals have demonstrated increasing profits through higher operating margins, increased charge/cost ratios, lower staffing ratios and a decrease in the Medicare share of patients, [14, 16, 17] suggesting operational changes that ensure higher payouts by insurers and preference for privately insured patients, while restricting costs by limiting staff growth. PE owned hospitals with lower staffing ratios also demonstrate lower patient satisfaction scores according to one study [14]. A recent study demonstrated hospitals adding more profitable service lines (I.e. robotic surgery, interventional cardiology, digital mammography) while discontinuing less profitable ones (psychiatric services) thus restricting access to certain crucial services while increasing costs due to higher charges from the more profitable service lines [25].

Debt Burden and Access

The debt financing of PE can threaten access to care in underserved areas if the acquired institution is unable to meet the payments and ultimately declare bankruptcy [26]. PE acquisitions are typically through leverage buyouts, where the acquired company bears the responsibility of paying the debt. Despite the heavy financial burden, investors returns are ensured through dividend recapitalization (selling junk bonds to pay dividends to its PE owners), management service agreements (hospitals paying large annual payments to the PE firm that owns them) and asset stripping (where PE firms sell off or lease assets to extract short term value upfront), while the acquisition is left in a precarious and heavily indebted position [2, 6]. In rural hospitals these debt burdens can particularly threaten their financial stability leading them to shunt their revenue to pay down debts rather than invest in lifesaving equipment or technologies [1, 2]. Even more concerning is the shutdown of these hospitals when they are unable to meet these debt obligations and declare bankruptcy, leaving a community in dire need of emergent care. One of the best examples is when Community Health Systems and Quorum Health Systems (predominantly owning hospital services in rural towns across the Midwest and the South) sold off or shuttered several of its rural hospitals and left few or no alternatives for acute care [27, 28]. A more famous

Table 1 Consolidation and its effects on quality (Q), access (A) and cost (C) with respect to patient care

Cited Example(s)	Setting	Effect on Patient Care (C, A, Q)	Comments
<p>1) PE nursing homes have worse quality metrics, [7] staffing ratios [8] and higher mortality rates despite higher Medicare reimbursements. [9, 33]</p> <p>2) PE nursing homes have better quality metrics in competitive markets where CMS metrics are incentivized [10]</p>	Nursing Home (NH)	Patients have higher costs (C) from higher Medicare reimbursements despite lower quality care (Q).	<p>1) Most of the studies showed poor quality of care and higher costs in PE nursing homes.</p> <p>2) One study showed a similar performance between PE and non PE nursing homes during but COVID – 19 pandemic, but PE NHs had less PPE in comparison non PE NHs.</p> <p>3) One study showed similar quality metrics between PE and non PE NHs, but the discrepancy may be from not distinguishing NH from post-acute care facilities [12].</p>
<p>1) PE owned hospitals showed fewer FTEs, worse patient satisfaction scores [14] and generally worse quality metrics compared to non-PE owned hospitals [16].</p> <p>2) PE owned hospitals have higher charge/cost ratios and higher profit margins compared to non-PE owned hospitals [16, 17].</p>	Hospital	<p>1) Patients have higher premiums (C) due to higher charges billed to insurance companies. This can keep them from seeking emergent care (A) due to costs.</p> <p>2) Patients generally have worse quality metrics and satisfaction scores (Q) in PE owned hospitals.</p>	<p>1) One study showed better quality metrics in PE owned hospitals, but the data was largely driven by HCA.</p> <p>2) One study showed there were no differences in quality metrics between PE and non-PE owned hospitals, but this paper does not use a difference in differences approach for the study [32].</p>
<p>PE owned dialysis centers in concentrated markets have higher hospitalizations, lower survival rates and declines in staffing [13].</p> <p>Dermatology clinics that are PE owned showed increases in prices paid to dermatologists by 3–5% per routine visit [18].</p>	Dialysis Center Dermatology Clinic	<p>Patients receiving care in PE owned dialysis centers have more complications and worse outcomes (Q)</p> <p>Leads to higher premiums from insurance companies.</p>	<p>This study looked at the effect of merger notifications and effect on patient care.</p>

Table 2 Revenue Generation and its effects on quality (Q), access (A) and cost (C) with respect to patient care

Cited Example(s)	Setting	Effect on Patient Care (Q, A, C)	Comments
Dermatologists see a larger volume of patients in PE owned clinics. No changes were seen in the volume of procedures [18].	Dermatology Clinic	Leads to less time spent per patient visit to address patient concerns adequately (Q).	1) This study has been critiqued that the modest effects seen is because it did not capture a major wave of dermatology acquisitions beginning in 2017. 2) This study also does not include elderly patients from Medicare and Medicare Advantage patients, which accounts for a large percentage of the procedures.
PE firms provide care by hiring physician extenders to work in unsupervised settings to generate additional revenue [22].	Dermatology Clinic	This often leads to performing procedures that are expensive and unnecessary, and leading to complications. (C, Q)	One firm in this study performed intralesional injections and skin biopsies in nursing homes, where 75% of the patients had Alzheimer's disease.
PE owned dermatology clinics have seen an increase in kickbacks, self-referrals and aggressive coding of procedures [21, 22].	Dermatology Clinic	Leads to overutilization of procedures (C). Dermatologists also make less than optimal referrals in response to patient needs. (Q)	Many instances of violating the Stark Law and the Antikickback Statute are noted in the study [22].
1) Some ophthalmologists report concern of performing more procedures, while physician extenders and optometrists provide eye care in the clinic [23]. 2) Other ophthalmologists stated no change to their practice under PE management.	Ophthalmology Clinic	It can lead to inadequately trained optometrists and physician extenders providing eye care.(Q)	The results are mixed in this study and more studies are needed to determine the effects of PE in ophthalmology.
1) Some behavioral specialists in PE have noted a change in the patient base that is more favorable for reimbursement (i.e., young insured patients using opioids vs. older patients with alcoholism paying with cash 2) PE marketing brings a surplus of eating disorder beds and pressure to fill these beds [34].	Behavioral Health Clinic	There maybe a deliberate preference for insured patients and provide less access for addiction care among those that are uninsured. (A)	More studies are needed to demonstrate the effects of PE on behavioral health.
PE owned hospitals have demonstrated higher operating margins, increased charge/cost ratios and a decrease in Medicare share of patients [14,16, 17].	Hospital	1) This suggests operational changes that ensure higher payouts by insurers (C) and a preference for privately insured patients (A). 2) These studies also demonstrate cost-cutting measures by limiting staff growth despite higher reimbursements (Q).	

Table 2 (continued)

Cited Example(s)	Setting	Effect on Patient Care (Q, A, C)	Comments
PE owned hospitals add more profitable service lines (i.e. interventional cardiology, digital mammography) while discontinuing less profitable ones (i.e., psychiatric care) [25].	Hospital	This study demonstrates restricting access to certain crucial services (A), while charging higher prices for the more profitable service lines (C).	This is the first study demonstrating preferential service lines by PE firms in the hospital setting.

Table 3 Debt Financing and its effects on quality (Q) and access (A) with respect to patient care

Cited Example(s)	Setting	Effect on Patient Care (Q, A, C)	Comments
PE owned Community Health Systems and Quorum Health Systems selling or shuttering rural hospitals in the Midwest and South due to debt burden [27, 28].	Rural Hospitals	1) Leaves underserved communities with access to few or no alternatives to acute care (A). 2) Leaves hospital systems generating revenue to pay down debt rather than provide invest in life saving technologies (Q)	Demonstrates the financial instability induced by debt burden in rural hospitals that are PE owned.
PE owned Hahnemann hospital declared bankruptcy and shut down being unable to meet the leasing obligations [29].	Urban Hospital	Leaves low-income population in Philadelphia with less access to acute medical care (A)	Provides an example of asset stripping and leasing obligations that financially destabilizes a safety net hospital.
1) US Dermatology Partners defaulted on a \$377 million loan leading to the closure of a number of clinics [30]. 2) DermOne closed numerous practices from debt insolvency. Combined this led to the closure of 100 locations [18].	Dermatology Clinic	Leads to diminished access for dermatologic care in communities. (A)	

example in the urban setting is Hahnemann hospital, which served a low-income population in Philadelphia, which had its assets stripped and sold to real estate with the profits going back to the investors, while the hospital incurred the debts. Ultimately the hospital, being unable to meet the lease obligations, declared bankruptcy and closed its doors in 2019 [29].

Dermatology practices have also seen similar events, such as when US Dermatology Partners [30], which was sold at 15x the EBIDTA, defaulted on a \$377 million loan or DermOne [18] closed its practices in six states for similar reasons. Combined, these two practices had 100 locations and their insolvency has implications for access in dermatologic care. There is growing concern that the aggressive buy and build strategies, increasing the multiples of EBITDA for a profitable sale, may be rendered unsustainable in the long-term and lead more practices to declare bankruptcy in a similar fashion [4]. This scenario is expected to intensify in the post pandemic setting.

Future directions

PE has two camps with some defending its role in providing efficiency and capital in the healthcare sector, largely attributing a neutral value to it with some good actors and bad actors and therefore recommend measures to mitigate the abuses that may arise from consolidation and revenue generation [31]. Still others believe that PE is ill suited in healthcare as it prioritizes investor returns above patient care and ultimately this will be reflected in the quality and safety of healthcare delivery. This paper provides some early insights into what

may happen to patient care in terms of quality, access and cost under private equity. There is reasonable cause for concern that there is a diminution in high quality patient care in PE owned institutions, especially in a noncompetitive market. We would take it a step further and state that there is potential harm for patient care under PE if there are insufficient regulations in consolidated markets. Therefore, we recommend studies are urgently needed in a number of healthcare sectors where PE is involved. The outline below is a select number of high priority areas that need further research.

- In the second wave of PE acquisitions, there are a large number of practices that have undergone PE acquisitions including ambulatory surgical centers, women's health clinics, gastroenterology, dentistry, orthopedics, urology and primary care. Studies into how patient care has been affected in these practices after PE acquisitions would be very valuable, either by adding to the current data, nullifying it or showing mixed results.
- The higher remunerations present for Medicare Advantage is concerning for increased coding intensity and making patients appear sicker than traditional Medicare patients [12]. Private equity's accelerated growth in primary care's Medicare Advantage health plans renders it a good subject of study, in terms of cost and quality of care, with implications for the value-based payment model.
- Early evidence suggests that PE performs well in quality and staffing in competitive markets or in markets where CMS incentivizes quality metrics [10]. Larger studies comparing competitive and noncompetitive markets on PE quality of care would better elicit the anticompetitive effects that result from consolidation and potentially steer PE's goals towards better quality metrics.
- It remains unproven if consolidation does indeed lead to better efficiency and economies of scale [19, 20]. A qualitative study specifically assessing the effect of PE on efficiency would be beneficial. If there is no effect on efficiency, the initial critique of PE consolidating only to increase in value becomes more plausible and concerning.
- Early data suggests mergers that were below the reporting threshold to antitrust authorities led to a higher morbidity and mortality compared to those that were above [13]. Further assessing the role of scrutinized mergers affecting patient care is beneficial and may give us better information of whether to lower or remove the threshold for notification under the Hart Scot Rodino Act.

The growth of PE in the last decade has been rapid with dramatic effects on the healthcare market, physician autonomy and the delivery of patient care. Without adequate studies carefully assessing whether the role of PE is good for healthcare, we may pay a heavy price in the public trust from unmitigated corporatization of medicine (Tables 1, 2, 3).

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