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CURRENT OPINION

Pharmacy Benefit Management Companies: Do They Create Value in the US Healthcare System?

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Abstract Pharmacy benefit management companies (PBMs) perform functions in the US market-based healthcare system that may be performed by public agencies or quasi-public institutions in other nations. By aggregating lives covered under their many individual contracts with payers, PBMs have formidable negotiating power. They influence pharmaceutical insurance coverage, design the terms of coverage in a plan's drug benefit, and create competition among providers for inclusion in a plan's network. PBMs have, through intermediation, the potential to secure lower drug prices and to improve rational prescribing. Whether these potential outcomes are realized within the relevant budget is a function of the healthcare system and the interaction of benefit design and clinical processes—not just individually vetted components. Efficiencies and values achieved in price discounts and cost sharing can be nullified if there is irrational prescribing (over-utilization, under-utilization and mis-utilization), variable patient adherence to medication regimens, ineffective formulary processes, or fraud, waste and abuse. Rising prescription drug costs and the increasing prevalence of 'high deductible health plans', which require much greater patient out-of-pocket costs, is creating a crisis for PBM efforts towards an affordable pharmacy benefit. Since PBM rebate and incentive contracts are opaque to the public, whether they add value by restraining higher drug prices or benefit from them is debatable.

Key Points for Decision Makers

Pharmacy benefit management companies (PBMs) operate between pharmaceutical manufacturers, pharmacies, patients and payers. By aggregating lives covered under their many individual drug benefit contracts with payers, PBMs have formidable negotiating power with manufacturers and pharmacies.

Three of the largest PBMs represent different business and value models: one is a stand-alone PBM, another is a unit in a corporation containing a large retail pharmacy network, and the third is a unit of a health insurer.

PBM rebate and incentive contracts are opaque to the public, and whether they add value by restraining higher drug prices or benefit from them is debatable. With the likely repeal of the Patient Protection and Affordable Care Act, there is no immediate realistic market mechanism(s) that creates or enforces transparency.

Content is nothing without context [1]

1 Introduction

Pharmacy benefit management companies (PBMs) operate between pharmaceutical manufacturers, pharmacies, patients and payers. By aggregating lives covered under

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their many individual contracts with payers, PBMs have formidable negotiating power. They use this position to influence access to and the cost of insurance coverage for drugs.

Insured patients may have been less aware of rising drug costs until high-deductible third-party insurance and larger patient cost sharing made it painfully personal. Since PBM pricing, rebate and incentive contracts are opaque to the public, whether they add value by restraining higher drug prices or benefit from them is debatable.

2 Background

Accessing pharmaceuticals and health services in the USA is strongly influenced by having health insurance. Of the 150 million people who have private health insurance coverage through a large employer, nearly all (99%) have a pharmacy benefit [2]. However, drug prices, private insurance coverage and the beneficiary's cost-sharing responsibilities are not determined by a regulatory authority once a medicine is approved. Until the rise of large private insurers, purchasers had little influence on the prices set by manufacturers.

The US FDA is prohibited from considering economics when reviewing evidence for a new drug's authorization; consequently, pharmaceutical prices are applied post-marketing authorization. This preference for private sector solutions assumes competition will stimulate price competition, efficiency and innovation. However, in the absence of direct competition and transparency, the market has not proven to be a reliable means of restraining pharmaceutical prices or their increases. Pharmaceutical expenditure is increasing more rapidly than healthcare expenditure overall, and specialty drug costs are outpacing those of other pharmaceuticals [3]. Prescription drug prices increased 12.2% in 2014 alone [4]; according to Blue Cross Blue Shield, specialty (biological medicines) costs per member increased 26% from 2013 to 2014 [5]. Instead, realized prices reflect negotiations. Costs net of rebates are generally not known and may differ from insurer to insurer. Uncertainty with these basic data limits objective value assessments [6].

Affordable health insurance is a continuing crisis in the US healthcare system. From 1999 to 2016, cumulative increases in worker contributions to health insurance (242%) exceeded increases in health insurance premiums themselves (213%), and both grew substantially more than changes in workers' earnings (60%) and overall inflation (44%) [2].

The most rapidly growing type of private health insurance products in the USA are high deductible health plans (HDHPs): from 4% in 2006 to 29% of employment-based insurance in 2016. HDHPs had the advantage of initially restraining the rate of increase in premiums due to a direct cost transfer to the insured. However, the combination of having a high deductible and having cost sharing for individual benefits can lead to potentially unaffordable annual expenditure. In total, 3% of individuals who spent more than $US1000 on drugs in 2014 represented one-third of total pharmaceutical expenditure under insurance policies for large employers [7]. The average deductible among workers with an HDHP grew from $US584 to $US1478 from 2006 to 2016, with 51% of workers at large employers in 2016 having insurance with an annual deductible of ≥$US1000 [2]. Contrast this with the median net financial assets of one person ($US1369) and multi-person households ($US3267) [8].

Pharmaceutical coverage offers some protection, but insurance coverage/benefit design and access to pharmaceuticals should be understood in terms of a patient's ability to pay—usually some combination of insurance and personal assets—rather than solely in terms of value, clinical outcomes or product price. In a recent survey, 26% of adult respondents reported having problems with medical bills within the past year (53% for uninsured, 20% for insured); of these, 52% of the insured identified problems with prescription drug payments, and 5% of them stated prescription drugs accounted for the largest portion of their medical payments [9].

The *Journal of the American Medical Association* [10] has argued "Effective approaches to control costs for high-priced medications need to be developed and evaluated to ensure broad, equitable, and appropriate use of these new interventions in an already stressed health care system."

3 Pharmacy Benefit Management Companies (PBMs)

First-generation PBMs [11] processed the high volume of individually small prescription drug payment claims. Process efficiency was the main business value, but this was easily commoditized. However, extracting clinically meaningful information from the claims transactions and integrating benefit rules into the operations expanded the value created by PBMs. The next generation of PBMs targeted formulary synergy between PBMs and pharmaceutical firms. PBMs were purchased by pharmaceutical firms but were also soon divested when that strategy did not work: Eli Lilly—PCS (1994/1998), Merck—Medco Containment Services (1994/2003), and SmithKline Beecham—Diversified Pharmaceutical Services (DPS) (1995/1999) [12].

Public pharmaceutical benefit management is a consolidated industry. Three of the largest PBMs represent three

distinct value models: (1) Express Scripts is a stand-alone PBM (~80 million members [13], ~97% of revenues come from PBM operations [14, 15]), (2) CVS/Caremark is a PBM (~80 million members [13]) within a corporation containing a large retail pharmacy network [16], and (3) UnitedHealth's OptumRx (~66 million members [13]) is a unit of the health insurer UnitedHealth Group [17]. These differences influence the ways they can add potential value to the healthcare system: (1) core pharmacy benefit services, (2) consolidation of the pharmacy benefit with the retail network (network effects), and (3) reduced transaction costs with health insurance integration.

PBMs now perform functions in a market-based healthcare system that may be performed by public agencies or quasi-public institutions elsewhere. For example, in the UK public sector, responsibilities and limited resources mean insurance coverage is based on evidence of a drug's value and its outcomes, and coverage is declined when the potential gain from a drug does not meet threshold cost-effectiveness values.

PBM intermediation among payers, retail pharmacies and consumers, pharmaceutical manufacturers and wholesalers provides integration to a decentralized array of services (Fig. 2). Through contracts with health plans and employers, PBMs can negotiate with potential network providers and manufacturers on the basis of the aggregated covered lives/potential prescriptions they represent and create competition for including providers in a plan's network and for product coverage and placement in the plan's drug benefit. Conversely, PBMs can gain additional revenue from 'spread pricing' [18]. In Fig. 1, the term 'ingredient cost' is used twice: once as payment by the health plan(s) to the PBM and again as payment by the PBM to the retail pharmacy. These ingredient prices are calculated using different formulas (i.e. based on average wholesale price [AWP] vs. wholesale acquisition cost [WAC]/maximum allowable cost [MAC]/average manufacturer price [AMP]) and can produce different results, that is, a 'spread'.

Beyond prices, there are multiple opportunities for PBMs to add value. On the basis of data collected for 7528 people spanning 12 cities, McGlynn et al. [19] assessed the actual care provided versus 439 evidence-based indicators covering 30 common conditions and preventive care. They reported that, on average, just 54.9% of care recommended by these indicators were received by patients in office-based practices. Medication use was slightly better (68.6% of the evidence-based medication indicators were met) but still indicated ample opportunity for improvement. Compounding these deviations from evidence-based prescribing practice, there are decades of evidence for variations in the clinical services and procedures performed [20]. Large national variations in prescribing practices have been reported for Medicare beneficiaries [21]. PBMs could improve the quality of pharmaceutical use if they could reduce these practice variations. "In an increasingly complex clinical care delivery environment, [PBMs may add value if they can] structure care delivery so that evidence-based best practice is the default course" [22].

The public–private US healthcare system offers numerous opportunities for efficiency improvement, reduced costs and quality improvements through coordinated care, negotiated prices based on evidence of value and accountability for care and outcomes. From FDA approval to a patient's receipt of a drug and observing its effectiveness in usual community practice, there are at least 13 distinct points of leverage to improve efficiencies, product selection, rational prescribing and patient engagement. This process is depicted in and the numbers that follow are linked to Fig. 2. The entities negotiating prices, designing and selling pharmacy benefit plans (1) market, enrol clients into and manage benefit plans (2 and 4), negotiate, construct and communicate with provider networks (3, 4, 6 and 12), use evidence of clinical efficacy to design formularies (7), create processes and guidelines by which the covered pharmaceutical(s) can be accessed or non-covered items considered for coverage (5 and 8), set client cost-sharing responsibilities (9), design and implement targeted clinical programmes for patient (10) adherence and use of clinical guidelines (11) and use feedback data from realized outcomes to manage deviations and refine programmes (13). Not all PBMs perform all functions or do so equally.

Creating value requires both scale and expertise. Advanced information technology (IT) capabilities and extracting clinical information from transactional data continue to be PBM core competencies. Growth in specialty pharmacy for biologicals has led to another PBM service: specialty pharmacy and limited distribution drugs (LDDs) [23]. The formulary benefit entails expanding from a three-tier model of generic, preferred brand and non-preferred brand to a four- or five-tier model. For example: Tier 1—preferred generic, Tier 2—non-preferred generic, Tier 3—preferred brand, Tier 4—non-preferred drug and Tier 5—specialty medicines. In the first three tiers, co-payments typically increase with each level. Tier 4 may include co-payment (which may be the full cost of the product) or co-insurance and Tier 5 consists of high-cost products with co-insurance for the patient's share [24]. Specialty medicines can fail to achieve cost-effective outcomes if they are not handled with clinical and pharmaceutical expertise. Consequently, the LDDs may require a separate carve-out from the pharmacy benefit and be serviced by separate pharmacies.

In addition, PBMs use techniques and programmes that have been researched and reported in the peer-reviewed

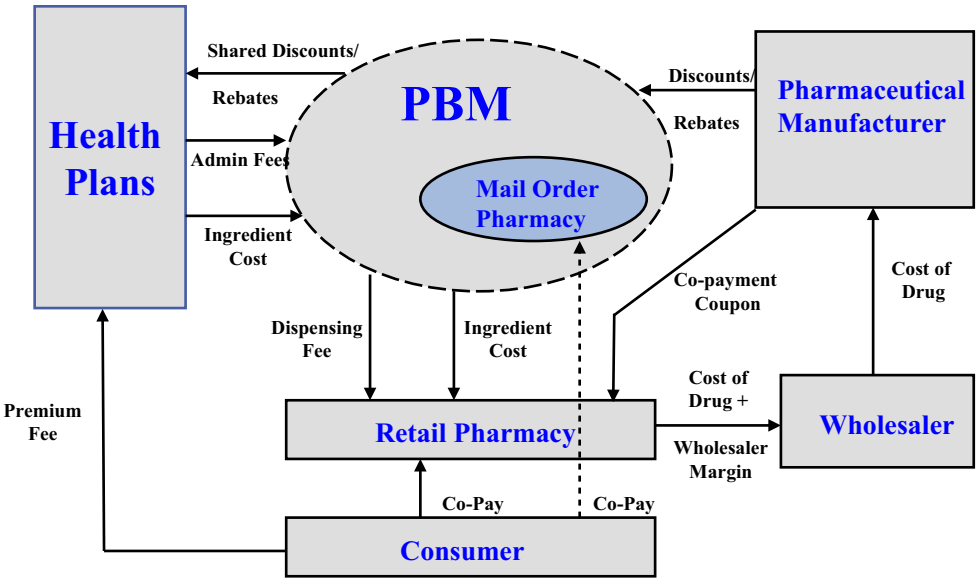

Fig. 1 Intermediation: US pharmaceutical benefits management company (PBM) roles in the flow of money and prescription drugs. Note: 'Ingredient cost' is not a single number for a specific drug, strength and dosage form. It can be and is calculated using different formulas for different contracts (i.e. based on average wholesale pricing vs. wholesale acquisition price/maximum allowable cost/average manufacturer price), leading to additional PBM revenue through 'spread pricing' Adapted from Congress of the United States, Congressional Budget Office [43]

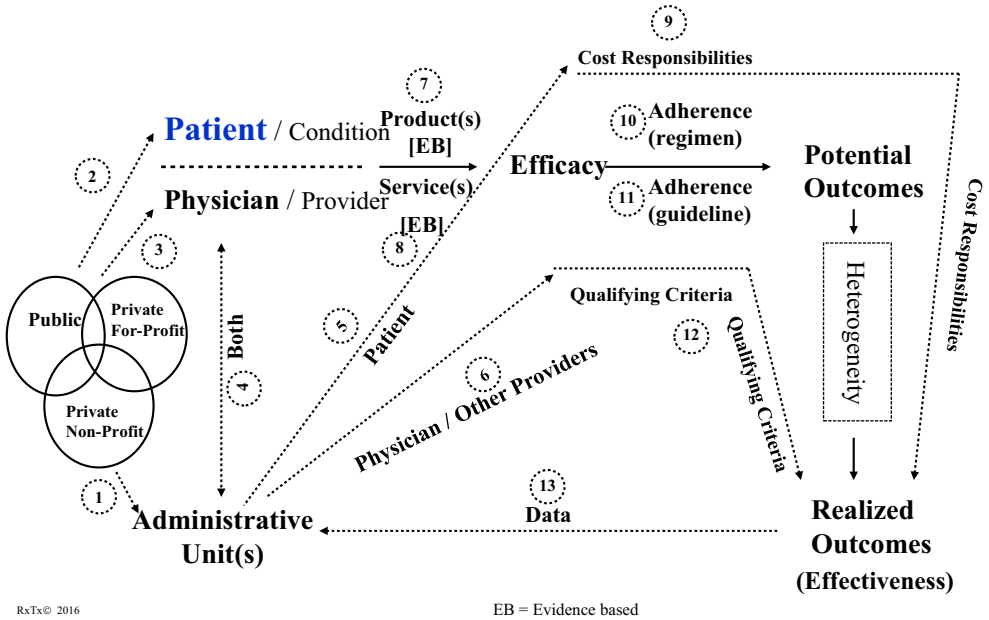

Fig. 2 Pharmaceutical use: a US systems perspective. From US FDA approval to a patient's receipt of a drug and observing its effectiveness in usual community practice, there are at least 13 distinct points of leverage to improve efficiencies, product selection, rational prescribing and patient engagement. Figure reproduced with permission of the author

literature as being effective—that is, have demonstrated value—and that have face validity. For example, techniques that direct use to the drugs with the best evidence include value-based insurance designs that use formularies [25], target high-risk enrolees, offer mail order refills [26], selectively require prior authorization to receive a drug [27], have low or zero co-payments [28] and use retrospective drug utilization review [29]. Operational details on the specific service offerings, programmes and innovations offered by PBMs in these categories are explained by Navarro et al. [12], Cohen and Wohletz [23], and Vogenberg [30].

PBMs (1) develop pharmacy networks and negotiate financial terms, such as payment based on dispensing fees or rebates; (2) develop mail order distribution capabilities; (3) negotiate and manage payment transfers with health plans and self-insured employers for ingredient costs, administrative fees and rebate/discount sharing; and (4) negotiate discounts and rebate from manufacturers (Fig. 2). Based on the terms of these arrangements and the PBM client's aims for its pharmacy benefit, PBMs develop product options based on a formulary process, targeted benefit cost sharing and clinical programmes to restrain

costs and promote appropriate access, influence demand, create competition and focus on value (Table 1).

Units within PBMs evaluate and produce peer-reviewed research on prescription drug benefits, design options and techniques to find the value in the price of a prescription drug and how it is used (e.g. Express Scripts' The Lab [31], CVS Health Research Institute [32] and United Health Group's OPTUM Labs [33]). Although rebates and discounts remain the core of the PBM business model, neither the amount(s) retained by the PBM [34] nor the subsequent payments to pharmacies are disclosed.

The assessment of whether, or the extent to which, PBMs add value to the healthcare system and/or to a payer's relevant budget depends on (1) whether the techniques they use work in general, (2) whether validated techniques work as implemented by each PBM and (3) the values of each product or service individually and collectively. For example, process efficiencies and values achieved in price discounts and cost sharing can be nullified by irrational prescribing (over-utilization, under-utilization and mis-utilization), variable patient adherence to their medication regimen, inefficient formulary processes or fraud, waste and abuse.

3.1 Issues

3.1.1 Conflicting Definitions of Value

Added value for the healthcare system is determined by the interaction of value creation and capture by stakeholders. Values differ and potentially conflict between manufacturers, insurers/employers, PBMs, wholesalers, physicians, patients and pharmacists.

- Manufacturers, PBMs and wholesalers benefit from rising drug prices since they increase the revenue to manufacturers, rising revenue for contracts based on a percent of price, and spread based on existing inventory versus price increases for that inventory.
- Obviously, patients benefit from more innovative and effective products and prefer few restrictions on covered drugs. If cost were not an issue, patients would likely demand the latest therapies.
- Pharmacies value access to insured populations, and rising prescription drug prices might benefit pharmacies, but PBM pharmacy payment contracts are not disclosed.
- Large employers reported the following pharmacy benefit management goals in a 2015 survey: (1) manage specialty drug cost trend (88%), (2) reduce inappropriate utilization (44%), (3) improve adherence and persistence (30%), (4) improve drug acquisition cost (31%), (5) improve patient satisfaction (6%) and (6) reduce variations in physician prescribing patterns (1%) [35].

3.1.2 Transparency and Political Oversight

Lack of transparency leaves open how much of the PBM value created by PBMs is retained and how much is received by clients.

The House Oversight and Government Reform Committee's ranking member commented on pharmaceutical prices for Mylan's EpiPen and Kaleo's Auvi-Q: "Increased competition is certainly good news … but we need much greater transparency over the massive profits these companies are making in order to ensure that the American People have affordable access to these life-saving drugs" [36]. Rep. Buddy Carter (R-Ga), a pharmacist and a member of the House of Representatives, was more

Table 1 Case study: pharmaceutical benefits management companies (PBMs) use market power and competition to capture value: hepatitis C virus (HCV) and sofosbuvir

Approximately 3.5 million people in the USA are seropositive for HCV, a disease that increases the risk for cirrhosis and liver cancer [44]. Without a cure, HCV prevalence cannot be contained
On 6 December 2013, Gilead Sciences received US FDA authorization to market sofosbuvir, an effective cure for HCV [45]. A 12-week course of therapy with sofosbuvir (Sovaldi™) came at the initial wholesaler acquisition cost (WAC) of $US84,000 for a standard course of treatment. In October 2014, sofosbuvir/ledipasvir (Harvoni™) was released as a single tablet, priced at $US94,500 [46]. These exceeded the capacity of state budgets to provide coverage for all who needed it and stressed the limits of private insurance eligibility criteria
A year after sofosbuvir was approved, a competitor product received approval (AbbVie's Viekira Pak™ [47], containing a combination of dasabuvir, ombitasvir, paritaprevir and ritonavir) and was priced at $US83,319 for a 12-week regimen [48]. Entry of a second and ultimately more direct acting antiviral (DAA) for HCV spurred price competition. One of the largest PBMs (Express Scripts) responded by dropping Gilead's product in favour of AbbVie's for an undisclosed but assumed lower price [49]
By 6 January 2015, CVS/Caremark, a PBM, made Gilead's product exclusive for its beneficiaries—presumably for a similar reason
Less than 15 months after the first HCV cure was approved, FDA cited existing marketed alternatives in its February 2015 decision to withdraw Merck's breakthrough drug designation for the combination product elbasvir/grazoprevir (Zepatier™) for HCV [50]
HCV DAAs demonstrate that markets can evolve. However, the process is inefficient, and the results are not transparent. Rebates and discounts, such as those of these HCV agents, are contractually hidden
Marketing authorization for elbasvir/grazoprevir missed the 2016 round of insurance benefit negotiations, but having another DAA option is expected to increase downward price pressure in successive DAA negotiations [51]

emphatic. He stated during a hearing on EpiPen price increases, "Prescription drug prices have soared and so have the profits of PBMs … Until we have more transparency in the PBM market, we're going to continue to see these kinds of cost increases" [37].

The Fall 2016 bipartisan political interest that might have resulted in government intervention has been superseded by election results that make such action now unlikely.

3.1.3 Manufacturers' Co-Pay and/or Coupons

PBMs negotiate discounts based on a manufacturer's willingness to trade discounts or rebates for an increased volume of their drug being covered through an insurance benefit. Some part of this rebate is then paid by the PBM to the insurer (or employer if self-insured). Such payments reduce the effective price paid for the product and may result in that drug's being placed on a coverage tier with lower patient cost sharing. This benefit design requires lower patient cost sharing for these preferred products, including generics if available, but higher cost sharing for non-preferred products.

Patient Assistance Foundations are 501 (c) (3) non-profit entities supported by donations (mainly from manufacturers) to facilitate access to medicines. Their actions are restricted to limit (1) the influence of large donors and (2) the assistance being heavily weighted to one or a few manufacturers or to an overly limited set of specific products [38, 39]. These programmes aid access for patients receiving low incomes and circumvent the effectiveness of tiered cost-sharing formularies that are constructed to influence pharmaceutical prescribing and use.

Patient assistance programmes apply to more than a single drug; consequently, manufacturers also offer coupons that target specific drugs. Co-payment coupons negate the manufacturers' incentive to negotiate rebates and tier placement with insurers. They also remove the financial incentive for a patient to use a lower-tier drug. The tiered formulary benefit design unravels and the consequences can be substantial. Co-payment coupons for 23 of 85 medicines for which both brand and generic versions were marketed during 2007–2010 experienced estimated $US0.7–2.3 billion higher insurance costs due to the co-payment coupons [40]. These costs contribute to the cycle of health insurance price increases.

4 Conclusions

PBMs use vetted techniques, but do they result in added value overall? The answer is surprisingly uncertain.

In markets other than healthcare, disintermediation creates value by eliminating the middle party. However, in the fragmented US system of pharmaceutical use, intermediation and PBM coordination costs must be weighed against the clinical and economic outcomes of pharmaceutical use. Even when a value can be attached to a PBM service, procedure or intervention, creating value(s) in one part of the system does not mean it cannot be lost elsewhere through process inefficiencies.

Furthermore, not all PBMs are alike. Of the three largest PBMs, one is freestanding, one is owned by an insurer and one is owned by a provider. Their approaches and what is valued are influenced by their ownership. Publicly available financial data demonstrate that PBMs add value to their shareholders, but whether the healthcare system receives a net positive value is unknown. Opaque contracts prohibit open discussion of terms, and non-disclosure violation may result in a pharmacy's being excluded from a network. Given this lack of transparency, it is possible to come to the opposite conclusion—that PBMs take value from the healthcare system.

With the likely repeal of the Patient Protection and Affordable Care Act [41], there is no immediate realistic market mechanism(s) that creates or enforces transparency. It appeared that the House Oversight and Government Reform Committee would promote legislation for greater prescription pricing and PBM transparency, but the 2016 election results suggest instead an uncertain or laissez-faire approach for the foreseeable period.

In the absence of legislative or regulatory action, payers will need to require greater transparency from PBMs as a condition of contracting, and evidence of not only a value-based benefit design but also value results. Individual pharmacies have a comparable approach by organizing for group representation through Pharmacy Services Administrative Organizations (PSAOs) to negotiate with PBMs [42]. Whether this is achievable or not is debatable.

Compliance with Ethical Standards

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