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Reforming CMS' Competitive Bidding Process to Improve Quality and Sustainability

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JULY 2018

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July 2018

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Contents

Introduction and Summary

In mid-July, the Centers for Medicare and Medicaid Services (CMS) released its long-anticipated revisions to the Medicare Durable Medical Equipment (DME) competitive bidding program. Prior to 2011, CMS used a set fee schedule to compensate suppliers who provided DME to Medicare patients. However, this set fee schedule was notoriously problematic. Witten and Howard (2004) summarized the problems commonly associated with this program:

> The General Accounting Office (GAO), the Office of the Inspector General of the U.S. Department of Health and Human Services (OIG), the Medicare Payment Advisory Commission [MPAC], and certain members of Congress have, for years, criticized the current Medicare reimbursement system for DME as being wasteful. They have also claimed that DME fee schedules lack a logical foundation. For the most part, DME fee schedules are tied to supplier charges from the base period 1986–1987. Those charges were simply supplier list prices and were not necessarily tied either to market prices or to actual costs. Critics of the current system further contend that DME fee schedules have become increasingly outdated as new products and new manufacturing technologies have been developed, and as a higher level of competition has reduced prices.[1]

Replacing this inefficient and costly fee schedule with a competitive bidding process is a promising reform. However, CMS implemented an illogical competitive bidding process that has created an entirely new set of problems. As a result, inefficiencies in CMS' purchases of durable medical equipment remain. CMS appears to have recognized these problems. In May 2018, CMS released an Interim Final Rule that included language indicating concerns with the competitive bidding program, and in mid-July, it released overarching reforms to the methodology for determining rates in the competitive bidding program. At the time of publication, this rule is open for public comment and will likely be finalized in mid-November 2018.

The purpose of this paper is to summarize the evidence that supports reforming the competitive bidding process and suggest modifications that would achieve two goals: improving the quality and sustainability of Medicare's durable medical equipment purchases, and creating sustainable savings for Medicare compared to its previously inefficient fixed fee schedule system.

The next section describes CMS' current competitive bidding process and compares this current system to the attributes of an efficient competitive bidding process. The results illustrate that the current structure is deficient and, if left unreformed, will lead to many unwanted consequences.

"The purpose of this paper is to summarize the evidence that supports reforming the competitive bidding process and suggest modifications that would achieve two goals...The results illustrate that the current structure is deficient and, if left unreformed, will lead to many unwanted consequences.

Theoretically, these adverse consequences should include reduced product quality, declining health outcomes, and eroding sustainability of the market. As discussed in the next section, the evidence illustrates that these adverse consequences are occurring in practice. Medicare patients are receiving lower quality durable medical equipment, which is taking a toll on their health outcomes. Further, there is mounting evidence that the reimbursement policies are destabilizing the supplier market, portending sustainability problems in the future.

CMS can address these problems by reforming its reimbursement policy once again. Due to the problems that plagued the fixed fee schedule, CMS should not return to this process. Instead, CMS should implement a competitive bidding process that adheres to the established efficiency criteria. These issues are discussed in the conclusion to the analysis.

CMS' Current Bidding Structure Is Inefficient

The competitive bidding program for durable medical equipment, prosthetics, orthotics and supplies (DMEPOS) encourages suppliers who operate in a specific bidding area to compete with one another. In principle, this is a good thing. All submitted bids must be less than the existing prices on DMEPOS fee schedules. According to CMS, the "bids are evaluated based on the supplier's eligibility, its financial stability, and the bid price. Contracts are awarded to the Medicare suppliers who offer the best price and meet applicable quality and financial standards. Contract suppliers must agree to accept assignment on all claims for bid items and will be paid the single payment amount. ***The amount is derived from the median of all winning bids for an item.***" [2]

> "Fundamental flaws in the structure of CMS' competitive bidding process raise concerns regarding the sustainability of these savings.

The *raison d'être* of the bidding program is to reduce Medicare's overall spending on durable medical equipment. And, the early evidence shows that overall spending levels have declined. Newman et al. (2017) evaluated the impact on spending from the initial rollout of the program in nine Metropolitan Statistical Areas.[3] The authors found that while Medicare expenditures under the previous fee schedule were significantly higher than the prices paid by large commercial insurers, "the initial years of the program produced prices comparable to those obtained, on average, by large commercial insurers—sophisticated purchasers that presumably were able to negotiate prices with suppliers of durable medical equipment and similar items."[4] Overall, "CMS anticipates that Medicare will save $25.7 billion in the period 2013–2022, while beneficiaries will collectively save an additional $17.1 billion."[5]

If these savings were sustainable, then these types of savings are exactly what a competitive bidding process is supposed to enable. However, fundamental flaws in the structure of CMS' competitive bidding process raise concerns regarding the sustainability of these savings. Further, there is mounting evidence that due to the inefficiencies associated with the current bidding process, the overall quality of the durable medical equipment used by Medicare patients is declining, to the detriment of patients' health care quality and rising higher health care costs elsewhere.

From CMS' perspective, an efficient competitive bidding process should encourage bidders to reveal their cost structures, discourage cheating, adequately fulfill the required demand, and minimize the prices that Medicare pays for durable medical equipment.[6] Such a process will also be sustainable long-term since the winning bids accurately reflect the bidders' cost structures. CMS' current bidding process violates these principles.

There are three devastating flaws with the rules that guide CMS' bidding structure. First, in contrast to most bidding processes, CMS uses the median of the winning bids as the compensation price. A more typical auction structure would use the market clearing bid as the compensation price, not the median of the winning bids. The market clearing bid is the lowest possible price that ensures adequate supplies are available. Unlike compensation based on the market clearing bid, an auction based on the median winning bid creates uncertainty and potential losses for bidders. For example, if a potential supplier was selected after bidding $10 per unit, but the median bid was $5 per unit, then the vendor would only receive compensation of $5 per unit despite its bid being 100 percent higher. Further, at $5 per unit in compensation, the supplier would be subject to potential losses. Such problems would not exist under a market-clearing price approach to the auction, and, thus, this median bid compensation structure creates unnecessary repayment uncertainty for potential vendors.

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Second, the current bidding process requires bidders to submit bids for each of the products in a particular category. CMS then establishes weights for each product and using these weights creates a "composite bid." This process differs from a lead product or single item approach that is standard in most auction/competitive bidding programs in other parts of the federal government. The composite bid approach introduces subjectivity into the process by allowing CMS to determine the weights; is complex and cumbersome, making it difficult for suppliers to understand how their bids relate to one another; makes it difficult for suppliers to understand what the actual final rates will be; and, creates market distortions that decrease transparency and skews the rates.

Third, and perhaps as a result of this repayment uncertainty that vendors face when submitting a bid, a winning vendor does not have to fulfill its commitment. Instead, a winning vendor has the right to view the median bid and then decide whether or not to participate. In response to this commitment problem, a 2015 legislative change requires all bidders to submit a $50,000 "bid surety bond" per bidding location, and the bidder must forfeit this bond to CMS if, after winning, the bidder decides to not participate.[7] By imposing a cost on bidders who decide not to participate in the program after being selected, the surety bonds are an important step in reducing the problems created when bidders do not have to follow through with their bids. However, the surety bonds do not address the repayment uncertainty problem created by setting the reimbursement price equal to the median bid. Therefore, by themselves, requiring surety bonds is an insufficient reform and the current auction process still incents economic inefficiencies.

For instance, vendors are incented to submit bids that underreport their cost structure, violating one of the key benefits that an effective bidding process is supposed to create – encouraging all vendors to submit

bids that honestly reflect their actual cost structures. Specifically, bidders know that if CMS chooses them, their compensation will not be the bid they submitted (these vendors receive the median of the winning bids as their compensation). This means that potential vendors will not bear the full costs from submitting bids with uneconomical prices. Vendors will receive benefits, however, from submitting an uneconomically low bid; the bidders increase their chances of being selected. Further, the costs from submitting uneconomically low bids are further diminished because even with the surety bond losses, a winning vendor always has the option to decline. Thus, there are smaller costs from bidding uneconomical prices, but many potential benefits.

> "The economic inefficiencies of the current bidding structure also portends adverse consequences for patient well-being.

There is also an incentive for unproductive gamesmanship. One example of this gamesmanship is potential vendors intentionally underbidding the economically viable price in order to reduce the profitability of their competitors.

In addition to these methodological flaws, the current competitive bidding program methodology relies on broad product categories. For example, the home respiratory therapy program lumps the product and services for home oxygen therapy with those for home sleep therapy, despite the products and services being very different. These broad product categories create the opportunity to further game the bidding process, potentially creating additional pricing inefficiencies.

The economic inefficiencies of the current bidding structure also portends adverse consequences for patient well-being. An example of this problem is the biasing of winning bids toward lower cost/lower quality medical equipment that is inappropriate for many patients. Thus, the ineffective bidding process is jeopardizing overall health care quality.

There have been several studies that confirm these concerns.

An analysis by Cramton et al. (2015) notes that "Medicare's program is unique in that it uses a never before seen median-price auction and does not make winning bids binding."[8] Cramton et al. (2015) define the fundamental "efficiencies that should result from a well-designed auction. *Allocation efficiency* occurs if the auction always leads to outcomes where winners have lower costs than losers. *Quantity efficiency* occurs if the auction results in a quantity being supplied at the point where supply meets demand."[9] The findings of Cramton et al. (2015) show that CMS' current bidding process fails to meet both of these efficiency criteria:

> By setting the auction price equal to the median winning bid, Medicare creates potential quantity inefficiencies as some winning bidders face a price less than their cost and therefore leave demand unfulfilled. Further, the incentives created by the median-pricing rule lead to nonexistence of equilibrium in many cases (especially when a bid ceiling is in place), thus creating allocation inefficiencies as high-cost firms sometimes displace low-cost firms as auction winners. These inefficiencies are unfortunate given that alternative auction formats such as the clearing-price auction have proven to perform well and are easily implemented.[10]

Parkin (2017) noted that CMS' bidding process is both ineffective and atypical. Specifically, he stated that CMS uses a

> significantly different [approach] from what Congressional members anticipated. More important, the approach is totally flawed.
>
> Because winning bidders are not obligated to actually sign a contract with CMS, the approach encourages suppliers to "low ball" their bids, thereby, creating a median price that is well below the true costs of producing quality products and/or providing necessary product support and service (e.g., home delivery of oxygen tanks).[11]

Merlob et al. (2010) ran experiments to compare CMS' bidding structure to a more conventional bidding process.[12] While in the conventional bidding process suppliers tended to reveal their costs, competitive prices tended to emerge, and sufficient supplies were procured, this was not the case for CMS' bidding process. The CMS auction tended to elicit "low-ball" bids from suppliers that did not reflect underlying cost structures, the prices tended to be well below competitive outcomes, and insufficient supplies were procured. Merlob et al. (2010) noted that these problems were not easy to fix under CMS' structure.

There are other identified problems with CMS' bidding structure that create more opportunities to game the system. For example, Katzman and McGeary (2008), noted "…that while utilizing competitive bidding in the Medicare process is an excellent idea, the format with which CMS experimented hinders both CMS and its beneficiaries from achieving greater savings."[13] Specifically,

"Katzman and McGeary (2008), noted "… that while utilizing competitive bidding in the Medicare process is an excellent idea, the format with which CMS experimented hinders both CMS and its beneficiaries from achieving greater savings.

> the root of the problem is that a firm's composite bid, and not its individual component bids, determines whether or not the firm is given Medicare provider status. Thus, while the individual bids are used to calculate Medicare prices, the composite bid determines whether or not the firm becomes a Medicare provider. As the composite bid is a linear function of individual bids, this avails the firm of a number of ways of achieving a targeted composite bid regardless of the cost of supplying individual goods. At best, this leads to vast uncertainty regarding prices on individual goods. At worst, it opens the door for "gaming" of the system.[14]

In fact, Katzman and McGeary (2008) illustrated that gaming the system is "optimal" behavior for bidding firms. Of course, such behaviors are the antithesis of what an efficient bidding process should incent.

Summarizing these concerns in a Hearing before the U.S. House of Representatives Subcommittee on Healthcare and Technology, the prepared testimony of Peter Cramton noted that "the fatal flaws in the CMS auction design were first identified by auction experts in September 2010.

The auction community—167 distinguished economists, computer scientists, and engineers engaged in auction and market design—sent a letter to many Congressional committees pointing out the flaws and urging action."[15] The main flaws that concerned these auction experts is summarized well by *Home Care* Magazine[16]:

- The rules violate a basic principle of auction design in that bids for the CMS project are not binding commitments. "In the Medicare auction, bidders are not bound by their bids. Any auction winner can decline to sign a supply contract following the auction. This undermines the credibility of bids, and encourages low-ball bids in which the supplier acquires at no cost the option to sign a supply contract," the letter states.
- The pricing rule is flawed because 50 percent of the winning bidders are offered a contract price lower than they bid, which further encourages low-ball bids. "Even if suppliers bid their true costs, up to one-half of the winning suppliers would reject the supply contract and the government would be left with insufficient supply … This pricing rule does not develop a sustainable competitive bidding process or healthy supplier pool," according to the letter.
- The use of composite bids "provides strong incentives to distort bids away from costs" (bid skewing), the experts pointed out, adding that bid skewing "is especially problematic in this setting since the divergence between costs and prices likely will result in selective fulfillment of customer orders. Orders for low-priced products are apt to go unfilled."
- There is a lack of transparency in how quantities associated with each bidder are determined, in quality standards and in performance obligations. More than 10 months after the Round 1 rebid [the initial test markets for the competitive bidding process], "we still do not know who won contracts," the commenters noted. "Both quality standards and performance obligations are unclear. This lack of transparency is unacceptable in a government auction and is in sharp contrast to well-run government auctions...."

Therefore, there is no sound theoretical basis underlying CMS' bidding process and theory predicts that implementing a competitive bidding process using CMS' structure will lead to adverse outcomes and fleeting budgetary savings.

The Empirical Evidence Supporting Competitive Bidding Reform

There are a large number of analyses that have examined the impacts of CMS' current bidding process that confirm the adverse outcomes are happening in practice. Starting with the studies that have evaluated the impact of the program on costs and prices, most studies are finding that the prevailing prices from the competitive bidding process are insufficient to cover suppliers' costs and, therefore, are not sustainable.

For example, in 2016 Dobson DaVanzo and Associates (DDA) conducted a survey of Medicare durable goods suppliers that represented 12.7 percent of Medicare expenditures.[17] On average, across the product types surveyed by DDA, suppliers were reimbursed at 88 percent of overall costs, and both large and small providers were unable to profitably provide the supplies at the prevailing prices. Importantly, DDA noted that the findings were consistent "across providers, regardless of size, and across DMEPOS products".[18] These results indicate that the current bidding process is financially unsustainable.

In a follow-up survey in 2017, DDA surveyed 1,064 beneficiaries, case managers, and suppliers to discover any impacts created by the current competitive bidding program on quality and sustainability from "a diverse range of stakeholders."[19] According to DDA, their

> findings indicate that the CB [competitive bidding] program has negatively affected beneficiaries' access to DME services and supplies, adversely impacted case managers' ability to coordinate DME for their patients, and placed additional strain on suppliers to deliver quality products without delay. While transitions are by their nature disruptive, the degree to which survey respondents identified negative impacts with CB suggests that the program is in need of mid-course corrections. If timely adjustments are not made, there is little doubt that beneficiaries, case managers, and suppliers will continue to face adverse outcomes, particularly in rural areas.[20]

In a formal analysis, Cramton (2012) analyzed claims and outcomes data to evaluate the impact of the bidding program finding that prices, the number of suppliers, and the number of submitted claims fell significantly following the implementation of the bidding program.[21] Specifically, Cramton (2012) noted that

> the drop in submitted claims together with the decline in Medicare prices means an even larger drop in Medicare DME reimbursements—an apparent program savings. However, we must recognize that utilization of the Medicare DME program has important health benefits and serves to reduce Medicare expenses in other programs. These benefits from utilization are lost if utilization declines, as must be the case given the substantial drop in claims.
>
> Indeed, the CMS data through September 2011 show the impact of declines in utilization of Medicare DME. In all cases, the result is a higher risk of death, a higher frequency of ER visits and hospitalization, and longer hospital stays. Since the costs of ER and hospital visits are several orders of magnitude higher than the Medicare DME costs, it seems clear that these hidden costs of the pilot auction system increase overall Medicare costs despite the Medicare DME savings.
>
> The decline in Medicare DME utilization would appear to be the result of the flawed auction design. The approach leads to the elimination of efficient providers and to prices that are below costs.[22]

The issues raised by Cramton are important to emphasize. While CMS emphasizes cost reductions in DME purchases in the short-term, higher health care spending elsewhere in the system offset these savings. Further, since the higher costs arise because patient outcomes are worse, the measured DME savings are likely to be illusory. These decreased patient outcomes are exemplified by the impacts that the new

competitive bidding program is having on the availability, quality, and health outcomes for diabetes testing supplies and home oxygen tanks.

Starting with diabetes, the American Association of Diabetes Educators (AADE) explains that access to the right diabetes testing systems and supplies is essential for effective self-management of the disease. Unfortunately, the competitive bidding program is limiting this access as evidenced by a 2014 survey of suppliers by the American Association of Diabetes Educators.

This survey found "that contract suppliers in Round 1 were not offering most of the products said to be offered on Medicare.gov, and most of the products available to Medicare beneficiaries before implementation of Round 1 were no longer available through the Competitive Bidding Program."[23]

In a 2017 update to the study, the survey results confirmed their concerns "that the CBP [competitive bidding process] is harming persons with diabetes by limiting access to and choice of DTS [diabetes testing supplies]. If beneficiaries have difficulty finding replacements for familiar products, they may be inappropriately influenced to switch DTS. Product switching can have negative health and economic consequences. When a beneficiary is forced to switch to unsuitable, unknown, confusing, or unreliable DTS, testing compliance may diminish or even cease. Poor blood glucose management can increase the risk of complications such as blindness, kidney damage, cardiovascular disease, and lower-limb amputations."[24]

> "The conclusion from these studies is that the competitive bidding program has reduced choices, reduced access to the diabetes testing systems that are most commonly used, and decreased the health outcomes for people living with diabetes.

The reduction in patients' access to more testing supplies is also associated with more deaths according to an analysis conducted by Puckerin et al. (2016).[25] In this study, they used Medicare claims data to compare the health results of beneficiaries using insulin in the nine test markets to the health results of beneficiaries outside of the test markets. Therefore, the analysis was able to differentiate whether the new competitive bidding program reduced beneficiaries' access to self-monitoring of blood glucose devices relative to the previous fee schedule; and if so, whether there were any negative resulting health outcomes. The study found that CMS' competitive bidding process obstructed beneficiaries' access to these devices, and that survival is negatively associated with reduced/no access to the self-monitoring blood glucose devices. Therefore, their results indicate that the new competitive bidding process reduced the quality of care for Medicare beneficiaries and, because patients required more inpatient admissions, the overall health care costs of these beneficiaries increased.

The conclusion from these studies is that the competitive bidding program has reduced choices, reduced access to the diabetes testing systems that are most commonly used, and decreased the health outcomes for people living with diabetes.

Decreased access to home oxygen equipment has also been widely documented. Like diabetes patients, there are severe health consequences for patients who require home oxygen therapy but do not receive it. According to the Council for Quality Respiratory Care, "newly-diagnosed COPD patients who start oxygen therapy within two months of first diagnosis have total health care costs downstream of that diagnosis that are about 20 percent lower than those who start oxygen later. This finding raises the policy concern that patients who delay oxygen therapy due to access problems in the early stage of treatment may generate health system costs that are materially larger than whatever savings CMS may be achieving via payment cuts."[26]

Unfortunately, the competitive bidding program is reducing availability of home oxygen supplies that risks creating these health problems. According to the Alpha-1 Foundation,

> The widening elimination of liquid oxygen is rooted in a competitive bidding program that Medicare put into effect in 2011. The program, which has been expanding in phases across the country over the last five years, was intended to reduce the cost of home medical equipment and services, including wheelchairs, beds and oxygen. But it has also caused providers to nearly phase out liquid oxygen because they cannot pass the high cost of liquid oxygen to Medicare or the consumers.
>
> This means that people with severe lung disease are seeing their liquid oxygen replaced with large compressed oxygen tanks. Those who use liquid oxygen to provide for their mobility are often unable to pull heavy compressed oxygen tanks around behind them, or to load up enough tanks in their vehicles so that they can breathe away from home for more than a short time.[27]

> "CMS implemented a bidding process that was not transparent, does not hold bidders accountable (their bids are not binding), discourages suppliers from submitting bids that accurately reflect their costs of providing the equipment, and discourages an adequate supply of medical devices and equipment.

The current bidding program is also impacting the quality of the oxygen services patients are receiving. Jacobs et al. (2018) evaluated the data from the Patient Supplemental Oxygen Survey, which is a self-reported questionnaire on the American Thoracic Society – Public Advisory Roundtable website.[28] Out of the 1,926 responses, mostly patients who use oxygen twenty-four hours a day, the authors found that significant problems exist including patients reporting equipment malfunctions (51 percent) and feeling unprepared to operate their equipment (one-third). Patients living in the areas with the competitive bidding program reported having problems more often (55 percent) compared to those who did not live in these areas (45 percent).

Conclusion
Reforms to the Competitive Bidding Program Are Necessary

The mounting data on CMS' competitive bidding program are the outcomes expected based on auction/competitive bidding theory. CMS implemented a bidding process that was not transparent, does not hold bidders accountable (their bids are not binding), discourages suppliers from submitting bids that accurately reflect their costs of providing the equipment, and discourages an adequate supply of medical devices and equipment. And, these are exactly the problems that are emerging in practice.

Due to uneconomical winning bids, suppliers are being driven out of the market creating supply shortages and a bias toward lower quality equipment and supplies. When coupled with patients forgoing the use of the sub-standard devices that are being offered, patient health outcomes are suffering. Ironically, due to the need to manage the larger number of patients with severe health consequences, overall health care costs are increasing. Thus, a program that is designed to reduce health care costs is, ultimately, increasing them.

> "Paramount among these needed reforms, CMS should replace its current methodology of setting the reimbursement price at the median winning bid. In its stead, CMS should set the reimbursement price equal to the bid that is just high enough to ensure enough suppliers will produce the right quantity and quality of DMEPOS goods and services (a market clearing price).

In light of these problems, the current competitive bidding program should be reformed. Returning to the previous set fee schedule is not the answer. These fee schedules rarely reflected the actual costs of acquiring the durable medical equipment and imposed excessive costs on Medicare. Instead, CMS should, as it has been recently proposed, replace its unique bidding process with a competitive bidding program that has a history of improving overall quality while reducing total costs.

Paramount among these needed reforms, CMS should replace its current methodology of setting the reimbursement price at the median winning bid. In its stead, and as proposed in 2018 rulemaking, CMS should set the reimbursement price equal to the bid that is just high enough to ensure enough suppliers will produce the right quantity and quality of DMEPOS goods and services (a market clearing price). Such a system would, essentially, replace the current bidding program with a more efficient market-based auction system. In the proposed rule, CMS calls this price the "maximum bid" which is, in essence, a market-clearing price, and no supplier will be required to accept a bid that is less than what it submitted.

CMS should also ensure that: the bidding areas are appropriately drawn such that the costs suppliers bear in providing the listed equipment is similar across the entire bidding area;[29] all bidders meet minimum quality and financial standards; and the bidding process is transparent such that even if suppliers are not selected, stakeholders and interested parties can see the bid arrays and understand how the rates were actually determined.

All suppliers interested in competing to provide the desired equipment should then be required to submit binding bids and/or provide bid surety bonds to ensure that vendors are committed to fulfilling their bids at the winning price. Due to the bid surety bond, those vendors who fail to follow through with their bid will pay a reasonable cost for failing to follow through on their commitment.

These types of bidding systems have historically performed well when judged against the efficiency criteria for a competitive bidding process – it creates both allocation efficiency and quantity efficiency. Since suppliers are committed to their bids, the bid prices offered reflects their underlying cost structures and discourage cheating. Further, since the winning bid price is based on the market clearing price, the problems of inadequate supply are minimized. Perhaps most important, due to the robust competition between suppliers who are submitting bids based on their unique cost structures, the market-based bidding process will help achieve CMS' cost savings goals and provide Medicare with the right amount and quality of durable medical equipment and services at more competitive prices.

This alternative bidding process indicates that establishing a competitive market for durable medical equipment was the right reform for CMS. However, the rules CMS established simply mitigated the expected benefits. Fixing these issues through a market-based auction process can lead to sustainable savings while also improving the health outcomes for Medicare patients.

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About the Author

Wayne H. Winegarden, Ph.D. is a Senior Fellow in Business and Economics, Pacific Research Institute, as well as the Principal of Capitol Economic Advisors and a Contributing Editor for EconoSTATS.

Dr. Winegarden has 20 years of business, economic, and policy experience with an expertise in applying quantitative and macroeconomic analyses to create greater insights on corporate strategy, public policy, and strategic planning. He advises clients on the economic, business, and investment implications from changes in broader macroeconomic trends and government policies. Clients have included Fortune 500 companies, financial organizations, small businesses, state legislative leaders, political candidates and trade associations.

Dr. Winegarden's columns have been published in the *Wall Street Journal, Chicago Tribune, Investor's Business Daily,* Forbes.com, and Townhall.com. He was previously economics faculty at Marymount University, has testified before the U.S. Congress, has been interviewed and quoted in such media as CNN and Bloomberg Radio, and is asked to present his research findings at policy conferences and meetings. Previously, Dr. Winegarden worked as a business economist in Hong Kong and New York City; and a policy economist for policy and trade associations in Washington D.C. Dr. Winegarden received his Ph.D. in Economics from George Mason University.

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