

Using Behavioral Economics to Design Physician Incentives That Deliver High-Value Care

Ezekiel J. Emanuel, MD; Peter A. Ubel, MD; Judd B. Kessler, PhD; Gregg Meyer, MD, MSc; Ralph W. Muller, MA; Amol S. Navathe, MD, PhD; Pankaj Patel, MD, MSc; Robert Pearl, MD; Meredith B. Rosenthal, PhD; Lee Sacks, MD; Aditi P. Sen, PhD; Paul Sherman, MD; and Kevin G. Volpp, MD, PhD

Behavioral economics provides insights about the development of effective incentives for physicians to deliver high-value care. It suggests that the structure and delivery of incentives can shape behavior, as can thoughtful design of the decision-making environment. This article discusses several principles of behavioral economics, including inertia, loss aversion, choice overload, and relative social ranking. Whereas these principles have been applied to motivate personal health decisions, retirement planning, and savings behavior, they have been largely ignored in the design of physician incentive programs. Applying these principles to physician incentives can improve their effectiveness through better alignment with performance goals. Anecdotal examples

of successful incentive programs that apply behavioral economics principles are provided, even as the authors recognize that its application to the design of physician incentives is largely untested, and many outstanding questions exist. Application and rigorous evaluation of infrastructure changes and incentives are needed to design payment systems that incentivize high-quality, cost-conscious care.

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For author affiliations, see end of text.

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The U.S. health care system is undergoing tremendous change aimed at controlling costs while maintaining or improving quality of care. Payment reform is a fundamental aspect of the transition. Recent years have seen a major shift from fee-for-service (FFS) toward value-based payment. Most recently, the Medicare Access and CHIP Reauthorization Act of 2015 expands pay-for-performance within the FFS system, but also creates a new merit-based incentive payment system, under which physician reimbursement will be based on quality, resource use, clinical improvement, and use of electronic health records (EHRs). In addition, a growing number of physician groups functions as accountable care organizations, participating in programs in which savings from a calculated baseline are shared between physicians and payers. To reinforce these payment changes, the Secretary of the Department of Health and Human Services announced that by 2018, 50% or more of Medicare payments to physicians and other providers will occur via non-FFS mechanisms.

Replacement of volume-based incentives embedded in FFS payment with value-based payments has the potential to drive health care decision-making. Although many organizations are beginning to assume financial risk, few have translated this risk into effective payment changes for physicians and other patient care providers. For instance, standard pay-for-performance programs have had little effect on physician behavior (1, 2), reflecting in part the relatively small size of the financial incentives. It may also reflect the trial-and-error nature of these programs. In general, efforts to reform physician payment have assumed that physicians are rational and have not incorporated principles from behavioral economics, which has documented many ways in which human behavior is not always rational (3, 4). Delivery and framing of incentives in a manner based on the science of human motivation could greatly improve response.

As organizations strive to reduce costs and improve quality, incorporation of behavioral economics principles into the design of physician incentives has the potential to make these programs more effective. Because physicians will be affected by these new incentive systems, they should understand the principles of behavioral economics, the science behind them, and the different forms they may take. This guidance is inherently preliminary because there has been little use and evaluation of behavioral economics in physician payment schemes. Consequently, we offer a framework to stimulate more systematic use and testing of behavioral economics in the design of physician incentives.

BEHAVIORAL ECONOMICS PRINCIPLES

The science of human motivation has evolved over the past 30 years. Previously, an underlying pillar of economic theory has been that rational individuals use information to make choices that optimize their well-being. In this framework, the main driver of behavior in response to economic incentives is the size of the bonus or penalty relative to the effort required to achieve the goal. Behavioral economics has revealed systematic ways in which human behavior is shaped not merely by the size of incentives, but also by their design and delivery. For example, the same-sized incentive could affect behavior differently depending on whether it is framed as a gain or loss, presented to people privately or in front of a group, or perceived as fair or unfair (5, 6). Because humans often make decisions that seem inconsistent with getting the most from a fixed incentive, they often seem "irrational" according to standard economic theory (3, 4, 7).

To illustrate how behavioral economic concepts could be relevant in influencing physician performance, we discuss 9 fundamental principles of behavioral economics (Table 1).

Table 1. Principles of Behavioral Economics Relevant to Physician Payment

Principle	Description	Examples in Health and Health Care
Limitations of information provision	Providing information is necessary and reflects social norms, but is rarely sufficient alone to induce behavior change.	<i>Smoking:</i> Smokers know that smoking causes cancer, but many, despite that information, continue to smoke. <i>Menu labeling:</i> In New York City, there was no significant change in mean number of calories purchased before and after menu labeling of calories.
Inertia, or status quo bias	People tend to favor the status quo and current practices rather than initiating change.	<i>Generic prescribing:</i> When generic drugs are the default in computerized physician order entry, prescription of generics increases significantly. <i>Organ donation:</i> When people must actively sign up to donate organs or not, such as in the Netherlands, 27.5% of population agrees to donate. In neighboring Belgium, organs are procured unless people actively refuse (an opt-out system). Consequently, 98% of Belgians are listed as donors.
Choice overload	Too many choice options or too complex choices induce paralysis and lack of action. Fewer, simple choices are more likely to induce behavior change.	<i>Health plan choice:</i> Choosing from the universe of health plans is difficult without someone prescreening choices and narrowing down the choice to a smaller number.
Immediacy	People respond more strongly to immediate incentives rather than delayed incentives.	<i>Using the gym:</i> People are more likely to go to the gym if given feedback today rather than at the end of the year on their use of the gym.
Loss aversion	People react more strongly to the same situation when it is framed in terms of losses than framed in terms of gains.	<i>Physician bonuses:</i> Paying physicians a bonus at the end of the year may be less effective than giving them the bonus at the beginning of the year and keeping it is made conditional on improvement in performance.
Relative social ranking	People care about how they compare with others, especially when those people are known and in close proximity to them.	<i>Release of physician performance data:</i> Physicians do not want to be viewed as a "low performer" relative to their peers.
Goal gradients and threshold effects	People try harder when they are close to achieving a goal and tend not to try as hard if they are far from the goal.	<i>Physician performance effort:</i> Physicians who are near a threshold target (e.g., 80% of patients who get β -blockers) will try hard to get there; those who are far away will view the goal as too difficult to reach.
Limits of willpower	Willpower is a limited resource. The more people need to exercise willpower in one activity, the less likely they are to have willpower in other activities.	<i>Physician effort:</i> Having to constantly remember to prescribe a generic is less likely to be effective than setting this up as a default within an electronic health record.
Mental accounting and salience	The incentive is stronger if given distinctly and explicitly rather than folded into regular compensation for an activity, such as a paycheck.	<i>Distributing physician financial bonuses:</i> \$1000 in a separate check is more noticeable than \$1000 electronically deposited as part of a paycheck.

Limitations of Information Provision

Information is necessary for people to understand their options and to communicate social norms but is rarely sufficient to induce behavior change, as seen in cases ranging from smoking cessation to menu labeling (8, 9). Even where changes in care will enhance value, merely providing physicians with the information regarding these options is unlikely to change their behavior. Thus, to promote high-quality, cost-conscious use of health resources, information on optimal practices will have to be combined with financial and non-financial incentives.

Inertia, or Status Quo Bias

When making choices, people typically demonstrate a status quo bias (10). Changing habits and settled practices usually requires explicit efforts and policies, such as implementing new defaults. Thus, it is important to structure a decision-making environment that makes it easy to provide high-quality, cost-effective care (11). For instance, physicians with an order entry system that defaults to generic drugs rather than brand-name medications order generics at higher rates (12). Similarly, when a system's oncologists agree that a specific care path is preferred, the preferred chemo-

therapy regimen and laboratory tests should be the default in the EHR's physician order set.

Choice Overload

When confronted with numerous or complicated options, people often avoid making choices (13, 14). For instance, an overabundance of performance metrics or alerts in the EHR can induce less rather than more behavior change (15). Choice overload presents a challenge to physician incentives. Incentives that are based on too few performance metrics could induce physicians to focus only on those evaluated, whereas too many can trigger inertia.

Immediacy

Immediacy enhances response, whereas delayed gratification dampens it. People tend to overestimate the immediate costs and benefits of their actions while discounting delayed benefits (16). Consequently, providing financial incentives or performance reports annually is usually less effective in changing behavior than doing so more frequently (17). Giving clinicians frequent interim feedback affords them an opportunity to modify their behavior and learn more quickly whether

the modifications improve performance. The optimal frequency, however, is unknown.

Loss Aversion

Whether options are framed as gains or losses influences how people view them. For example, people feel more positively about medical interventions described as providing 90% survival rates than ones described as having 10% mortality rates. Closely related is the endowment effect. Simply owning something—a sports ticket or a mug—increases its value to the person above its monetary value.

People work harder to retain a provisionally awarded bonus than they do to receive a yet-to-be-awarded bonus. For instance, teachers' performance improved more when they were paid in advance and asked to return the money if students did not improve sufficiently compared with when they were given year-end performance bonuses (18). Similarly, the Massachusetts General Hospital employed loss aversion by giving an incentive to everyone in one year so that in the subsequent year, it would feel like a loss not to get the incentive (19, 20).

Relative Social Ranking

People are heavily influenced by their perception of how their performance compares with those around them (21–23). Physicians' sense of competitiveness can be deployed by distributing identified rankings to physicians within one's group, or even to the general public. For example, Dean Clinic in Wisconsin found that releasing anonymous rankings had little impact on physician behavior, whereas releasing monthly performance data by name, visible to all physicians in their division, was much more effective (Mooney A. Dean Health System. Personal communication). In addition, organizational awards for outstanding performance, conferred publicly, emphasize the organization's norms and priorities while providing social recognition for physicians. Of note, social comparison approaches can recognize team-based outcomes and not only individual-level outcomes, potentially facilitating collaboration to improve patient care while preventing competition among team members.

Goal Gradients and Threshold Effects

As people approach a goal, they try harder to achieve it, but once they reach the threshold, effort may drop—a phenomenon known as the “threshold effect” (24, 25). Poorer performers, concluding that they cannot reach the targeted threshold, may stop trying to improve. Recognition of improvements in performance as well as overall performance is important to encourage participation by those who are further away from the desired thresholds.

Limits of Willpower

Exerting willpower can literally be tiring and makes people less likely to expend effort on subsequent tasks (26). Thus, relying on physicians' vigilance to achieve optimal performance is unlikely to produce sustained improvement. Infrastructure that uses defaults to make the right action the “path of least resistance” will keep

physicians from expending the energy to continually make the highest-value decisions.

Mental Accounting and Salience

People react very differently to the same amount of payment if it is separate and visible as opposed to packaged together with much larger sums of money (27–29). For example, a \$100 incentive is more powerful if disbursed as a separate check than if it is folded into a paycheck.

There are other important behavioral economic principles, but we believe that these 9 represent those most likely to be used to shape physician incentives.

USING BEHAVIORAL ECONOMICS TO DEVISE EFFECTIVE PHYSICIAN INCENTIVES

These behavioral economics principles have been used with great effect in a variety of contexts, including consumer savings behavior, retirement planning, personal health behavior, and enrollment in health insurance (5, 6, 30–35). To date, they have not been systematically incorporated into the design of physician incentive programs. As health systems increasingly assume financial risk and need to focus physicians on high-quality, cost-effective care, however, behavioral economic approaches are likely to shape incentive programs. Although there are few empirical data to guide how best to apply behavioral economics principles in developing physician incentives for high-value care, we believe that there are 4 ways in which physicians will encounter behaviorally designed incentives (Table 2).

First, organizations are likely to use relative social ranking alone, without financial incentives, particularly to reduce wide variation in use of unnecessary or costly services. Organizations might disclose to physicians their peers' use of costly interventions, such as positron emission tomography-computed tomography for patients with breast cancer, magnetic resonance imaging for new-onset back pain, and use of the new PCSK-9 inhibitors to control cholesterol. As Dean Clinic has shown, physicians dislike being outliers and adjust their practice patterns to conform when provided with a relative social ranking. This method is not provision of abstract information based loosely on performance goals, but rather relies on social ranking to arouse competition. This strategy is relatively inexpensive to implement.

Second, organizations are likely to combine principles of mental accounting, loss aversion, and relative social ranking to provide financial rewards separately from regular paychecks with performance recognized in a peer forum. For instance, Advocate Physician Partners, a clinically integrated network of nearly 5000 physicians partnered with the Advocate Health Care System, makes individual performance rankings visible to all physicians in their practice group and holds an annual public awards ceremony. Invoking mental accounting and loss aversion, Advocate Physician Partners distributes paper checks for rewards, including a report on unearned dollars and what performance

Table 2. Likely Uses of Behavioral Economics for Physician Incentives

Incentive Design Element	Underlying Principle	Health System Example
Provide social ranking without financial incentives	Individuals are influenced by their perception of how their performance compares with that of their peers.	Dean Clinic has shown that public, identified social ranking improves physician performance.
Make financial rewards salient by using mental accounting and social ranking	Mental accounting, loss aversion, and relative social rank suggest that financial rewards should be kept separate from regular paychecks and that individuals should be publicly recognized for achievements.	Massachusetts General Hospital mails reward checks to the physician's home. Advocate Physician Partners holds a public awards ceremony. Advocate Physician Partners and Dean Health System make performance rankings visible to peer physicians.
Make financial rewards salient through timing	Salience of incentives could be improved by distributed at times when the payment is likely to be particularly important to and recognized by the recipient.	Advocate Physician Partners pays incentive payments around 15 April, when taxes are due. Massachusetts General Hospital distributes checks at the start of the holiday season.
Change processes of care	Infrastructural and process changes (e.g., making high-value practices the default in the electronic health record) can be used to overcome inertia and the limited willpower.	Dean Clinic introduced nurse review of health records to close gaps in care. Introduction of generic prescribing as default in the electronic health record.

would have been needed to receive the additional incentive (Patel P, Sacks L. Advocate Physician Partners. Personal communication). Similarly, the Massachusetts General Hospital prints checks and mails them to the physician's home (19, 20). This allows the physician's family to see the recognition and the financial payment and provides emotional reward to the physician.

Third, organizations are likely to enhance the impact of financial incentive payments by delivering them at times when the money is particularly salient. For instance, Advocate Physician Partners pays its incentives around 15 April (when taxes are due), and the Massachusetts General Hospital distributes checks during the winter holiday shopping season.

Fourth, to overcome inertia and the limits of willpower, organizations are likely to change processes of care to add additional checks for certain important practices, or make high-value care the default. For example, rather than relying on physicians to remember various practices during office visits, Dean Clinic has nurses review EHRs and contact patients to close care gaps involving cancer screening tests, immunizations, and adherence to care related to chronic conditions.

OUTSTANDING ISSUES

The application of behavioral economics to physician incentives is largely untested, and many questions exist. We discuss 4 major outstanding issues.

First, choice overload and mental accounting and salience suggest that having too many performance metrics and complex financial incentives is a problem. A virtue of FFS is that it incentivizes one metric: maximizing relative value units. Trying to improve quality and reduce cost require multiple metrics. There is a tension between having sufficient measures to assess quality of care and choice overload, but we do not know the optimal number of metrics to enhance performance.

Second, the best distribution of incentives between individual physicians and their physician group is unknown. Whereas incentives to individuals can drive indi-

vidualistic behaviors that are harmful to the group, incentives to groups may dilute and compromise individual effort. Advocate Physician Partners began providing 70% of the incentive on the basis of the individual physician's performance and 30% on the basis of performance of his or her group. Conversely, the Permanente Medical Group allocates almost all incentive dollars at the departmental level; limits the total dollars to less than 10% of annual salary; and applies them only to quality and service measures, not cost. This is an area needing further experimentation.

Third, using incentives to induce cost-consciousness can raise concerns about skimping on care. This is one reason why health systems have tended to focus physician incentives on improving quality and patient safety rather than reducing use of low-value services. An important area for future development is to identify areas in which quality gaps and excessive costs coexist. Such examples might include medical interventions that are proven to be of equal clinical effectiveness in randomized trials but of lower cost, such as the use of hypofractionated radiation for early-stage breast cancer, or in which cost savings do not affect quality, such as dispensing generics or 90-day supplies of medications (36, 37).

Fourth, the size of financial incentives needed to change different types of behaviors is unknown. In Medicare's Acute Care Episode bundled-payment model, physicians were able to receive a maximum of 25% payment increase per procedure to improve their compliance with quality metrics (38). Other organizations have used 2%, 5%, or 20% of base salary, and for each of these approaches, anecdotal evidence points to multiple successes. To move from anecdote to science, the association between the size of incentives and behavior change, and where there are diminishing returns, needs rigorous evaluation.

The U.S. health care system is undergoing significant change away from payment based on volume of services to payment based on the provision of high-value care. Many health systems now have contracts

that link physician payment to demonstration of higher quality and lower costs of care. They face challenges in aligning individual physician behavior with these new payment models. Going forward, systematic incorporation of the principles of behavioral economics in the design of physician incentives holds promise to improve the effectiveness of these incentives. It will be critical to test combinations of infrastructure changes, nonfinancial incentives, and financial physician incentives across different settings. Features that could strengthen incentives, including public recognition and ranking, immediate feedback, and cost-effective defaults, should be implemented and tested in order to study what works and what doesn't work across different settings. Systematic evaluation of incentives will enable health care delivery systems to adopt the programs most likely to motivate high-value care.

From the Perelman School of Medicine and The Wharton School, University of Pennsylvania, Leonard Davis Institute Center for Health Incentives and Behavioral Economics (CHIBE), University of Pennsylvania Health System, and Center for Health Equity Research and Promotion, Philadelphia Veterans Affairs Medical Center, Philadelphia, Pennsylvania; Fuqua Business School and Sanford School of Public Policy, Duke University, Durham, North Carolina; Partners Healthcare System and Harvard School of Public Health, Boston, Massachusetts; Advocate Physician Partners, Chicago, Illinois; The Permanente Medical Group, Oakland, California; and Group Health, Seattle, Washington.

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Requests for Single Reprints: Ezekiel J. Emanuel, MD, Department of Medical Ethics and Health Policy, Perelman School of Medicine, 122 College Hall, University of Pennsylvania, Philadelphia, PA 19104; e-mail, vp-global@upenn.edu.

Current author addresses and author contributions are available at www.annals.org.

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Current Author Addresses: Dr. Emanuel: Department of Medical Ethics and Health Policy, Perelman School of Medicine, 122 College Hall, University of Pennsylvania, Philadelphia, PA 19104.

Dr. Ubel: Sanford School of Public Policy, Duke University, 100 Fuqua Drive, Box 90120, Durham, NC 27708.

Dr. Kessler: Department of Business Economics and Public Policy, The Wharton School, University of Pennsylvania, 3620 Locust Walk, Philadelphia, PA, 19104.

Dr. Meyer: Partners Healthcare System, 800 Boylston Street, 11th Floor, Boston, MA 02199.

Mr. Muller: University of Pennsylvania Health System, Perelman Center A-5, 3400 Civic Center Boulevard 4382, Philadelphia, PA, 19104.

Dr. Navathe: LDI Center for Health Incentives and Behavioral Economics, Department of Medical Ethics and Health Policy, Perelman School of Medicine, University of Pennsylvania, 1108 Blockley Hall, 423 Guardian Drive, Philadelphia, PA 19104-6021.

Dr. Patel: Advocate Physician Partners, Quality Committee, 1661 Feehanville Drive 200, Mt. Prospect, IL 60056.

Dr. Pearl: Permanente Medical Group, 1800 Harrison Street, Oakland, CA 94612-5190.

Dr. Rosenthal: Harvard T.H. Chan School of Public Health, 677 Huntington Avenue, Boston, MA 02115.

Dr. Sacks: Advocate Physician Partners, 2025 Windsor Drive, Oak Brook, IL 60523.

Dr. Sen: LDI Center for Health Incentives and Behavioral Economics, University of Pennsylvania, 3641 Locust Walk, Philadelphia, PA 19104.

Dr. Sherman: Group Health Physicians, 320 Westlake Avenue North, Seattle, WA 98109-5233.

Dr. Volpp: LDI Center for Health Incentives and Behavioral Economics, Department of Medical Ethics and Health Policy and Medicine, Perelman School of Medicine, The Wharton School, University of Pennsylvania, 1120 Blockley Hall, 423 Guardian Drive, Philadelphia, PA 19104-6021.

Author Contributions: Conception and design: E.J. Emanuel, P.A. Ubel, J.B. Kessler, G. Meyer, P. Patel, R. Pearl, M.B. Rosenthal, K. Volpp.

Analysis and interpretation of the data: E.J. Emanuel, G. Meyer, R. Pearl, K. Volpp.

Drafting of the article: E.J. Emanuel, P.A. Ubel, G. Meyer, A.S. Navathe, P. Patel, R. Pearl, A.P. Sen, P. Sherman, K. Volpp.

Critical revision of the article for important intellectual content: E.J. Emanuel, P.A. Ubel, J.B. Kessler, G. Meyer, R.W. Muller, A.S. Navathe, P. Patel, R. Pearl, M.B. Rosenthal, L. Sacks, A.P. Sen, P. Sherman, K. Volpp.

Final approval of the article: E.J. Emanuel, P.A. Ubel, G. Meyer, R.W. Muller, A.S. Navathe, P. Patel, R. Pearl, M.B. Rosenthal, L. Sacks, P. Sherman, K. Volpp.

Statistical expertise: R. Pearl.

Obtaining of funding: K. Volpp.

Administrative, technical, or logistic support: A.P. Sen, K. Volpp.

Collection and assembly of data: G. Meyer, L. Sacks.