

Behavior



benefits
MAGAZINE

Reproduced with permission from *Benefits Magazine*, Volume 56, No. 11, November 2019, pages 24-31, published by the International Foundation of Employee Benefit Plans (www.ifebp.org), Brookfield, Wis. All rights reserved. Statements or opinions expressed in this article are those of the author and do not necessarily represent the views or positions of the International Foundation, its officers, directors or staff. No further transmission or electronic distribution of this material is permitted.

Behavioral Economics:

Three Tools for Improving Prescription Drug Adherence

by | **Eric Culley, Pharm.D.**, and **Eric M. Parmenter, CEBS**



Medication nonadherence is a costly but avoidable problem for both health plans and plan participants. Plan sponsors can use strategies from behavioral economics to help participants take their medications as prescribed.

When patients with chronic or serious medical conditions fail to take their prescription drugs as prescribed, the result is often adverse outcomes for the patient and extra costs for the health plan. The patient may experience worsening health and/or additional hospitalizations and other unplanned treatment generating the increased costs for the plan. These adverse outcomes also place extra burdens on family caregivers and employers because the employee may miss work and experience lower productivity in addition to all of the direct health care costs.

Estimates show medication nonadherence rates range from 25-50% and degrade over time.¹ Studies have estimated that nonadherence creates more than \$100 billion in avoidable health care costs annually.^{2,3} *Adherence* is the extent to which a patient takes medication timely, as prescribed. *Non-adherence* can include not taking the medication at all, skipping doses, etc.

In the immediate term, nonadherence can result in up to a 10% increase in hospitalizations and emergency room and urgent care visits, as well as additional physician and specialist visits.⁴ The medium-term impact of nonadherence can be higher rates of heart failure, use of multiple drugs for the same condition and depression. The long-term impact can include increased incidence of or worsening of chronic conditions such as diabetes, high cholesterol, high blood pressure and rheumatoid arthritis.

Prescription drug expenditures have increased faster than spending for other health care services over the last 25 years.⁵

Specialty medications represent 35% to 40% of most health plan drug costs, which can total thousands to tens of thousands of dollars per month.⁶ The high cost of these drugs underscores the importance of patients taking them correctly.

Barriers to Adherence and Common Approaches for Improvement

Patients fail to follow their prescribed drug regimen for several reasons. One study showed that for patients with congestive heart failure, simply helping them become compliant with their medications helps avoid between \$860 to \$2,500 in medical costs per person, per year.⁷

There are many barriers to adherence that are impacted by benefit design, like aggressive prior authorization requirements, mandatory mail order (which may help or hurt adherence) and complicated specialty medications.

However, one of the most common reasons for medication nonadherence is simple forgetfulness. With busy schedules and numerous distractions, remembering to take medications can be a challenge for the most organized people. Common approaches to address forgetfulness are pillboxes with compartments for each day and time of day. While there are reminder apps for smartphones and prepacked mail-order envelopes with medications bundled by date and time, these approaches may not overcome the long-term behavior patterns that lead to noncompliance.

A second common barrier to adherence is the side effects associated with taking specific drugs or a combination of drugs. The typical approach to adverse reactions is clinical intervention to switch drugs, manage the side effects or change dosing. This may not be ideal in the case of some drugs, like metformin, that are known to have adverse events that manifest shortly after the start of therapy but typically resolve over time. Patients may stop taking the drug after the initial adverse reaction, even though it was likely to be resolved eventually.⁸

Out-of-pocket costs are a third barrier to adherence. Prescription drug costs continue to increase at a faster rate than other medical costs, often leading to higher copayments, co-insurance or other out-of-pocket costs. The patient may slip on adherence if these costs become a financial burden. Plan sponsors often use plan design to encourage use of generic drugs or lower cost brand-name drugs. A study on value-based insurance design (VBID) found that an abundant amount of evidence that increased consumer cost sharing

takeaways

- Studies have estimated that medication nonadherence results in more than \$100 billion in avoidable health care costs annually.
- Common reasons for nonadherence include forgetfulness, drug side effects, drug costs and low health literacy.
- Cognitive biases such as the status quo, endowment effect, framing and confirmation biases also can affect whether plan participants take their medication as prescribed.
- A smart pillbox that uses Bluetooth technology is one example of a tool that can help change patient behavior by alerting patients when they forget to take medication, take the wrong medication or take the right medication at the wrong time.
- Providing incentives and immediate gratification for small successful steps can help patients create new beliefs about success and failure and learn positive behaviors.

causes patients to reduce their use of appropriate and inappropriate health care services.⁹ With VBID, copayments are waived or lowered for high-value drugs and other services, and it has been demonstrated to increase drug adherence without adding extra cost to the plan.¹⁰

Low health literacy is a fourth barrier to adherence. Physicians, pharmacists and care managers attempt to combat these issues with education and ongoing support. Clinicians frequently involve the patient's social support networks to help reinforce the importance of medication adherence and to help ensure that the right dosing regimen is followed. One study showed that flash cards and videos can help improve adherence in the short term.¹¹ However, one-time education is often insufficient because information about prescription drugs, dosing regimens and disease progression can be complicated and confusing. Add a multilayered health care system with complex benefits and benefit designs to this mix, and it becomes clear that in order to produce successful outcomes, medication education should not be a one-time event.

Behavioral Economics

Traditional economics assumes that humans make decisions that are in their own self-interest as rational beings. This species of humans could be called *homo economicus*, making highly evolved decisions based on the widely accepted principles of economics, like supply and demand.¹² However, real humans often make decisions that are seemingly not in their self-interest or that appear to be irrational.

Behavioral economics is the study of how people make choices that draws on insights from psychology and economics and is a popular newer field of study in business schools.^{13,14}

Many health and benefit decisions should be rational but are not because the information is complex, confusing and difficult. In particular, irrational decisions involving health care, including prescription drugs, benefits and finances, are prevalent throughout people's lives because the decisions are difficult with respect to both content and emotions, and people often fail to act or give up as a result. According to behavioral economist Daniel Kahneman, humans have *bounded rationality*, meaning that people are rational only to a point because they rely on context, cues and habits to make decisions rather than careful thought. This does not suggest that most people lack intelligence but that there are too many

decisions to make so people rely on heuristics and cognitive biases to make decisions

Biases are prejudice in favor of or against one thing, person or group compared with another. *Heuristics* are rules of thumb or memory aids that allow for quick decisions.

Humans make hundreds of decisions every day. According to Kahneman, two systems are used to make decisions:¹⁵ *System One* is fast and is used for 95% of decisions. This system engages first, engages every time, is easy and automatic, and happens unconsciously. Heuristics are deployed in System One and triggered by biases. *System Two* is slow and used for 5% of decisions. The system engages last, engages occasionally, and it is deliberate, difficult and conscious.

In order to influence behavior change using System Two, information is provided that hopefully leads to changing minds and, ultimately, behavior. For instance, during annual open enrollment, benefit leaders often use System Two to help people understand benefit options and how to enroll. Brochures, documents and presentations are provided to employees with question-and-answer sessions to help them make good decisions. However, because the information is difficult, confusing and complex, employees often use System One instead to make decisions, such as asking friends what they plan to pick and other biases such as framing, discussed later.

Using Behavioral Economics to Improve Drug Compliance

Cognitive Biases

Following is a discussion of four cognitive biases that affect medication adherence.

- **Status quo bias:** People tend to stick with the current state of affairs, even though there are clearly better

learn more

Education

To view the authors' presentation "Behavioral Economics: Three Tools for Improving Prescription Drug Adherence That You Can Use Today" and the Prescription Drug Cost Management Virtual Conference, visit www.ifebp.org/virtual/prescription-drug-cost-management.

Health Care Management Conference April 6-8, 2020, Phoenix, Arizona

Visit www.ifebp.org/healthcare for more details.

TABLE I

Larry's Prescribed Drug Regimen

Condition Treated	Drug Class	Generic Name	Brand Name	Dosing
Congestive heart disease	Diuretic	Furosemide	Lasix®	Once daily
Diabetes	Oral antidiabetic	Metformin	Glucophage®	Twice per day, morning and evening
Hypertension	Ace inhibitor	Quinipril	Accupril®	Daily in the morning
Hyperlipidemia	Statin	Simvastatin	Zocor®	Daily in the evening

TABLE II

Overcoming Larry's Cognitive Biases

Cognitive Bias	What Larry Is Thinking	LaDawn's Strategy
Status quo	"What? I have to take these pills two times a day, every day? Some in the morning, others at night? How can I remember?"	Create new habits that become the status quo
Endowment effect	"You mean I have to give up bacon cheeseburgers to lower my cholesterol?"	Create ownership in something new, engaging and interesting
Framing	"Preferred brand must be better than generic, obviously?"	Rename and reframe
Confirmation	"See, I told you this drug doesn't work. I haven't lost weight and the side effects are bad."	Share success stories and testimonials and group discussions, adjust medication as needed

ways of doing things. Although most people would label this as procrastination, standard economics assumes that people will always do something if it is in their best interests to do so, like switching cable and internet providers when the promotional offer expires, but they often don't switch.

- **Endowment effect bias:** The fear of loss is a stronger motivator than the hope of gain. Studies show that people will not sell their lottery tickets when offered multiples of what they paid because of fear of missing out (FOMO) if the lottery ticket is a winner.

- **Framing bias:** People are influenced by how an item is positioned relative to other items.
- **Confirmation bias:** People cherry-pick information that confirms their previous beliefs rather than evaluating facts objectively.

To understand how behavioral economics can be used to improve drug compliance, consider a semifictional case study. Larry is a 42-year-old male suffering from multiple health issues, including heart disease, diabetes, high blood pressure and high cholesterol. These are brought on by an unhealthy lifestyle that includes poor eating habits and lack of exercise. Larry's employer recently invited him to engage in a care

management program through a vendor partner of the health benefit plan. He was contacted by a care advocate, named LaDawn, who started by getting to know Larry in a holistic way and helped him schedule a complete physical exam with a new primary care physician. His doctor prescribed the drugs outlined in Table I.

This drug profile was already optimized for generics and for a simple regimen, but there are multiple things that Larry has to remember, including which drug to take, how many times per day per drug and what time of day to take the drug.

Applying these biases to the example of Larry and LaDawn, Larry defaults to at least four biases as illustrated in

TABLE III

New Prescription Drug Formulary Descriptions Can Leverage the Framing Bias

Tier	Typical Formulary Description	New Formulary Description
Tier 1	Generic drugs	Highest value drugs
Tier 2	Preferred brand-name drugs	More expensive advertised drugs
Tier 3	Nonpreferred brand-name drugs	Even more expensive advertised drugs
Tier 4	Preferred specialty drugs	Specialty drugs for rare conditions
Tier 5	Nonpreferred specialty drugs	More expensive specialty drugs for rare conditions

Table II. LaDawn’s goal is to use heuristics to help Larry change his behavior as shown.

Larry is struggling with years of bad habits and strong biases. For example, Larry’s prescription was recently changed from brand Accupril to generic quinapril, but his blood pressure may be up because he is agitated due to other circumstances, not because the generic drug does not work.

LaDawn will deploy new strategies to change the status quo, reframe and endow Larry with new tools. She will work hard to change:

- What feels easy
- What feels right
- What feels good.

The following are the strategies that LaDawn uses with Larry, leveraging behavioral economics principles.

Strategy One: Changing the Status Quo and Endowment Bias

Larry received a smart pillbox as part of his agreement to participate in the care management program. Larry now feels a small sense of ownership in the program because this pillbox is expensive and much different from

the typical pillbox. The smart pillbox sorts Larry’s medications by day and time of day, but uses Bluetooth® technology to link to Larry’s smartphone through an app that sends text messages to remind him to take a specific medication at a specific time with a brief note about why it is important. The smart pillbox knows when a compartment door has been opened or not, and Larry will receive a medical alert and/or phone call if he forgets to take his medication, takes the wrong medication or takes the right medication at the wrong time. LaDawn also receives notifications and an emailed report of Larry’s behavior and references the report during regular check-ins.

By switching to the smart pillbox, new defaults for behavior are formed during the first month and become the habitual norm in the months to follow. By using a new default, the status quo is changed from random or unrewarded behavior to structured behavior. Larry has been endowed with new tools in his health journey and does not want to lose those tools. These tools include the smart pillbox but also the wrap-

around support from his app and from LaDawn.

Strategy Two: Changing the Confirmation Bias

A *confirmation bias* is a type of cognitive bias that involves favoring information that confirms previously existing beliefs or biases.

As an example, Larry may believe that there is nothing he can do to help himself when it comes to over-eating and failing to exercise, because he views it as an issue of willpower and lacks the necessary willpower to change. The fact that he had tried and failed many times confirms this belief. When he binges on junk food, he may say, “See, this proves that I just can’t help myself.” Changing confirmation bias with new evidence is difficult because it involves System Two thinking, so LaDawn is looking for a System One strategy.

LaDawn and Larry agree that Larry will participate in an online game that provides new incentives and immediate gratification for small successful steps. In this game, an online tracker is used whereby:

- Larry receives daily prompts via text message or email to report his medication.
- Larry earns points for self-reporting exercise, verifying prescription refills, taking weekly quizzes and surveys, and reading daily health tips.
- Larry's successes are entered into weekly sweepstakes and monthly leaderboard competitions.
- Larry redeems points for health-related merchandise such as fitness trackers, blenders and other wellness products in a rewards mall (adding to the endowment effect).
- Larry also will participate in group meetings and watch videos with testimonials from successful participants and experts to confirm new beliefs about success and failure.

Larry began to enjoy the challenge and the interaction with other people, and the quick rewards began to undo his old patterns. The new confirmation forms a new bias that positive behaviors lead to both immediate rewards and longer term results as well.

The good news is that over the course of eight months, Larry dropped 30 pounds, stayed compliant with his drug regimen with only a few minor slips, and enjoyed more energy in his life and productivity at work. His employer enjoyed lower plan costs and the benefits of increased productivity. While the names and some of the facts have been changed in this example for the sake of confidentiality, this example is based on many actual cases, all of which have had similar problems at the beginning and better outcomes after addressing the behavioral economics of the individual situations.

Strategy Three: Changing the Framing Bias

One last strategy is about how plan sponsors can change the framing bias through the redesign of open enrollment materials, videos and enrollment website language to encourage greater use of generic prescription drugs.

Prescription drugs are typically listed on a formulary indicating the category that a drug falls into and the corresponding copayments or other cost-sharing structure. Ninety percent of plan sponsors use a tiered cost-sharing formulary for prescription drugs.¹⁶ These tiered formularies, and the language used within them, frame each drug with a label that may not necessarily suggest the behavior that the plan sponsor would like to change. For instance, if the plan sponsor would prefer for the member to take a generic drug rather

bios



Eric Culley, Pharm.D., is a vice president at Evolent Health in Pittsburgh, Pennsylvania where he is responsible for leading the Evolent pharmacy enterprise, which consists of teams that work with their partners on all aspects of the pharmacy benefit, including developing pharmacy benefit management strategies, evaluation of clinical pharmacy programs and improving overall health plan performance. With more than 20 years of pharmacy and managed care experience, Culley has managed multiple aspects of prescription drug benefits for employee, commercial, exchange, Medicare and Medicaid lines of business. He holds a bachelor's of pharmacy degree, master's of business administration degree and a doctor of pharmacy degree, all from Duquesne University.




Eric M. Parmenter, CEBS, ISCEBS-Fellow, ChFC, CLU, LUTCF, REBC, RHU, SPHR, is a national leader of direct provider solutions at Collective Health in Nashville, Tennessee. He is a national expert on the impact of health care reform on health care providers and is a respected thought leader in the hospital health system industry. Parmenter has extensive experience in health plan strategy, design, prevention care, and productivity and behavioral economics. A former executive at Evolent Health and principal with Towers Watson, he has worked in the employee benefits business for 30-plus years as an advisor to hospital and health system clients, developing health benefit and prevention care strategies that align with the health system's population health business. He has published the book *STOP!: 21 Steps to Reduce Stress and Enhance Joy* and has authored more than 20 articles on employee benefits topics. He holds a B.A. degree in psychology from the University of Illinois and an M.B.A. degree from the University of Chicago Booth School of Business.

than the brand-name drug, why is the brand-name drug in a category called *preferred brand*? Benefit practitioners understand that *preferred* in this context means preferred over an even more expensive brand-name drug, but the member may think that the preferred brand must be better than generic because it sounds more appealing. This is an example of framing that may lead to unintended consequences.

A plan sponsor could switch to the naming convention in all communication materials and through messaging and call support from the pharmacy benefit manager according to the new formulary descriptions on the right side of Table III on page 29.

While the example in Table III may use exaggerated language to make a point, the idea is that the names we use to frame choices matter a great deal.

Conclusion

Behavioral economics has important tools for benefit leaders to help humans make better decisions, including the improvement in prescription drug adherence. The value of drug adherence can be seen in the unnecessary costs that are often incurred, and the opportunities to advance public health that are lost, when medicines are not taken for their full prescribed course.¹⁷ 

The opinions expressed in the article are those of the authors and do not necessarily reflect the views or opinions of their employers.

Endnotes

1. See www.ncbi.nlm.nih.gov/pmc/articles/PMC3934668/.
2. L. Osterberg and T. Blaschke, "Adherence to medication." *New England Journal of Medicine*. 2005;353(5):487-497.
3. IMS Institute for Healthcare Informatics. "Avoidable costs in U.S. health care." 2013.
4. See www.ncbi.nlm.nih.gov/pmc/articles/PMC3934668/.
5. William Custer, "Prescription Drug Costs and Health Insurance Plan Design." *Journal of Financial Service Professionals*. May 2018.
6. IMS Institute for Healthcare Informatics. "Avoidable costs in U.S. health care." 2013.
7. See www.medpac.gov/docs/default-source/reports/jun14_ch07.pdf?sfvrsn=0.
8. See <https://medlineplus.gov/druginfo/meds/a696005.html>.
9. Rajender Agarwal, Ashutosh Gupta and A. Mark Fendrick, "Value-Based Insurance Design Improves Medication Adherence Without An Increase In Total Health Care Spending." *Health Affairs*, July 2018.
10. Ibid.
11. D. L. Yeung, K. S. Alvarez, M. E. Quinones et al. "Low-health literacy flashcards and mobile video reinforcement to improve medication adherence in patients on oral diabetes, heart failure, and hypertension medications." *Journal of the American Pharmacists Association*. 57(2017)30-37.
12. *Homoeconomicus* is a term coined by Richard Thaler.
13. See www.apa.org/monitor/dec02/nobel.html.
14. See <https://news.uchicago.edu/story/richard-thaler-wins-nobel-prize-his-contributions-behavioural-economics>.
15. Daniel Kahneman, *Thinking, Fast and Slow*. New York: Farrar, Straus and Giroux, 2011.
16. William Custer, "Prescription Drug Costs and Health Insurance Plan Design." *Journal of Financial Service Professionals*. May 2018.
17. See www.pfizer.com/news/featured_stories/featured_stories_detail/the_value_of_drug_adherence.

