Insights

Advancing the science of pharmacy care

Fall 2014

adherence

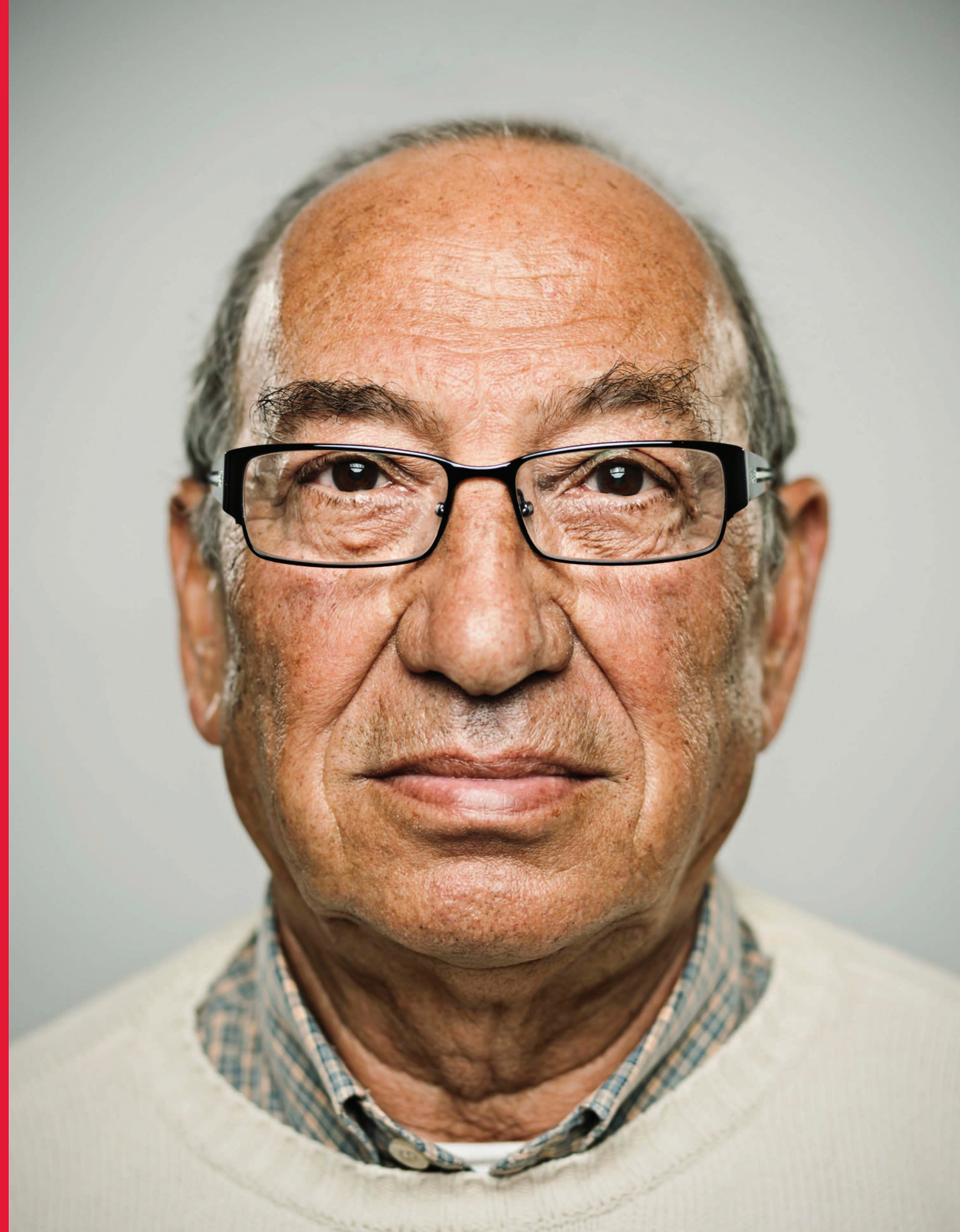
why it's so hard and what we can do about it

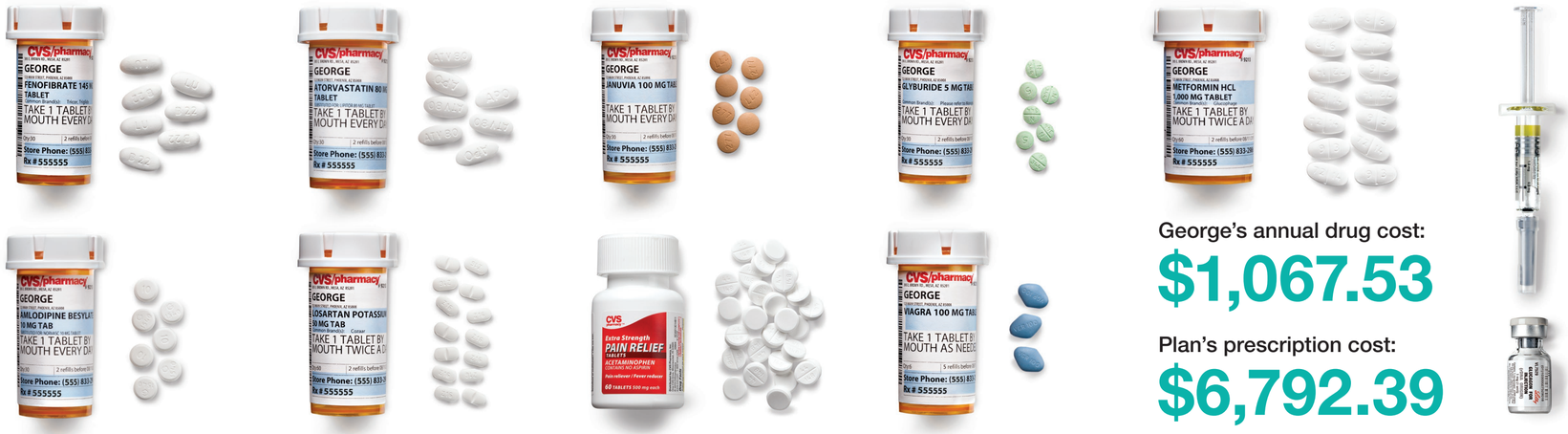
CVSHealth

George has diabetes.

And hypertension, high cholesterol and arthritis. He's 62 years old, takes nine different prescription medications and sees two different doctors. He finds it hard—and somewhat discouraging—to take everything when he's supposed to. He misses doses some days, and he seems to find himself running out of one drug or another nearly every week. The thing you have to know is George is not at all unusual.

Patient story is presented for illustration purposes only. Any resemblance to an actual individual is coincidental.
All data sharing complies with applicable firewall and privacy laws.





George's annual drug cost:

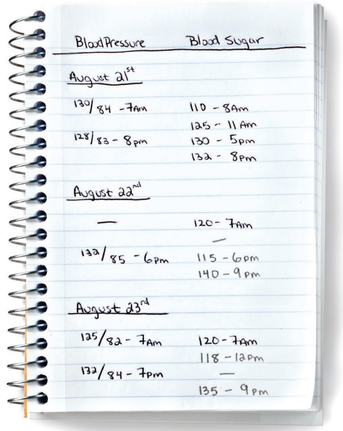
$1,067.53

Plan's prescription cost:

$6,792.39

Here's what George needs to stay adherent: one week's dosage of prescription and over-the-counter medications—plus an emergency glucagon kit

Blood pressure monitor



Diary of blood pressure and blood sugar readings

Glucose monitor, lancets and test strips

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Costs calculated based on CVS/caremark trend cohort pulled on 8/15/2014 with copays of $5 for tier one products and $25 for tier two products. Over-the-counter cost based on CVS/pharmacy brand pricing 8/15/2014.
This document contains references to brand-name prescription drugs and medical products that are trademarks or registered trademarks of pharmaceutical manufacturers not affiliated with CVS/caremark.

Why don't people take their medicine?

Everybody has their own reason, or reasons. Simple forgetfulness is common. Some people can't afford to fill their prescriptions, or they may have a hard time getting to the pharmacy. Others don't understand how to take their medicine or why it's necessary or how to deal with side effects. Some just don't like the idea of taking drugs.

It's clear no simple fix will suffice, but at CVS Health, we recognized that we have a unique opportunity to help. Perhaps more importantly, by helping we could positively impact outcomes for millions of people.

Our opportunity rests largely in the populations we serve. With our integrated model, CVS Health is unique among health companies. We provide pharmacy benefit management (PBM) services to nearly 65 million Americans, representing a huge cross-section of ages, income levels, health status and varieties of insurance coverage. Our retail pharmacies serve more than 5 million customers a day. Seventy million households are actively enrolled in ExtraCare®, the CVS loyalty card program. Our specialty pharmacy services support nearly a million patients with complex or rare conditions. And MinuteClinic®, the most successful retail-based clinic in the nation, has provided more than 20 million patient visits since 2000.

Through Pharmacy Advisor we have interacted with millions of patients and made significant improvements in adherence.

The populations we serve give us access to a diverse and broad data set—information about how people fill and refill prescriptions, the impact of plan design and utilization management strategies, the challenges faced by people with multiple diagnoses and complicated treatment regimens. When we have the opportunity to integrate medical and pharmacy claims, we have insight into the impact of prescribed therapies and adherence on medical events and costs. Moreover, CVS Health has a longstanding, enterprise-wide commitment to analytic research with the teams and resources in place to fuel in-depth analysis.

With all these factors in play, we've undertaken a long-term project to understand and improve adherence. Over the last 10 years, in collaboration with researchers at Harvard University, Brigham and Women's Hospital, the University of Pennsylvania and other institutions, we've published or presented over 50 adherence-focused papers in peer-reviewed journals and clinical conferences. *See page 14 for a partial listing.*

Some of our research takes the form of meta-analysis, as when our research team combed through decades of published peer-reviewed studies and pooled the results to evaluate the impact of adherence on overall medical costs. Using our own claims data, we took a deep dive into uncovering and understanding individual patient behaviors and barriers. We also surveyed patients and reviewed how they interact with their health care providers and their families. We reviewed the impact pharmacy benefit plan designs and copay structures can have.

This research helped to build a foundation on which we developed and implemented adherence programs across the enterprise, resulting in literally tens of millions of interventions with CVS/pharmacy customers and PBM members. We provided refill reminders, offered automatic prescription refills and renewals for people on long-term medications, found ways to lower prescription costs, improved patient education and counseling, and worked with payors and providers to help patients stay on track with prescribed therapies.

Research showed that pharmacist counseling was highly effective in helping patients change their behavior, so we developed the infrastructure and systems to better support one-on-one personalized counseling in our retail pharmacies and through our PBM call centers—our Pharmacy Advisor program. Through Pharmacy Advisor we have interacted with millions of patients and made significant improvements in adherence.

Today we're evaluating exciting new opportunities to provide relevant information to providers to help them take better care of their patients. For example, we have the capability to deliver patient-specific information on adherence directly to electronic health records (EHRs) in Patient-Centered Medical Homes (PCMHs).

In an environment where providers increasingly are reimbursed for providing higher-quality care, such information can help them improve patients' health, while helping physicians obtain compensation for the additional time they are spending with patients.

The results of all these efforts have been carefully monitored and evaluated, and we've taken what we've learned and applied it to improve the programs. These programs have had significant impact, potentially saving payors billions of dollars by reducing risk of hospitalizations and other adverse events.[3]

A complex challenge

All of this research, all of our interventions, all of our carefully tracked results have made one thing abundantly clear: adherence is not simple. It's a complex behavioral challenge, one that becomes exponentially more difficult for patients with multiple diagnoses, disabling illnesses or challenging life situations.

Our work to understand and improve adherence is ongoing. In the following pages, we share some key insights we've gained and some of the innovative solutions we're developing. As you'll see, these solutions span the complex process a patient goes through, starting in the prescriber's office when the prescription is written. We also take a look at what benefit plan sponsors can do to improve adherence in their member populations.

At CVS Health, we've taken on the goal of unlocking adherence, helping to bring adherence to optimal levels for the tens of millions of Americans with chronic conditions that we touch every year. It's an important step in our corporate mission of helping people on their path to better health.

2017 Goal

Increase adherence by 5–15% through new interventions.

Nearly

50%

of people taking a chronic medication stop taking it in the first year,[1] with the biggest drop-off occurring in the first month.[2]

Adherence starts when the Rx is written.

With at least nine medications to take in a day, it's not hard to imagine George missing some doses over the course of a week. That's probably our most common picture of non-adherence, but it's not the only way people are non-adherent.

Research indicates that up to a third of prescriptions written are never filled. Some never get taken to the pharmacy. Some make it to the pharmacy but are never picked up. In fact, people with many prescriptions, like George, are more likely not to fill a new prescription.

Prescribers want and expect patients to fill prescriptions and take prescribed medications, and our research has shown that prescribers are important influencers on patient adherence. However, up until the last few years prescribers haven't had a clear picture of what happens once they've written the prescription. That changed with the introduction of electronic prescribing (e-prescribing). Most new prescriptions—70 percent—are now submitted electronically.[5]

E-prescribing has given us important insights about what happens once a prescription is written. Just as important, it gives us an unprecedented opportunity to intercede at the point of prescribing, providing actionable information so we can help prescribers ensure patients follow their prescribed drug regimen and offer rapid feedback when they don't.

Relative influence on medication adherence:[6]

Prescriber

34%

Pharmacist

26%

Patient

40%

It's been estimated that up to a third of prescriptions written are never filled.[4]

Three key issues

Sticker shock at the pharmacy counter

Cost is a big barrier to adherence. Research shows that prescriptions with higher copays are less likely to be filled.[7] And we know that the adherence of people who move to a high-deductible health plan tends to drop, as does that of people who hit the donut hole with their Medicare Part D coverage.[8] "Dispense as written" (DAW) on a prescription also makes it less likely to be filled. DAWs often specify dispensing a more expensive brand-name medication as opposed to a less costly alternative.[9]

An Rx that's easy to fill

Extra steps in the filling process make it more challenging for patients to fill the prescription. Most prescriptions are now written electronically; if the prescription is printed out and handed to the patient, it's less likely that it will be filled than if it's sent directly to the pharmacy.[10] Prior authorizations, which are used to help ensure safe and appropriate medication choices, may require validation of a diagnosis or prior trial with a different drug. That extra step may also make it less likely that a prescription gets filled.

Knowing when patients are non-adherent

In the evolving health care environment, where compensation is increasingly tied to performance, information about patient non-adherence is especially valuable to prescribers. CVS/caremark market research (2012) indicates that 68 percent of physicians are interested in EHR notices if patients are non-adherent.

How we can help

Point-of-prescribing messaging

Our e-prescribing systems allow us to let the doctor know that a drug they're about to prescribe is not on the formulary or has generic options. That way, a less-costly alternative can be prescribed if the physician believes that it is clinically appropriate. Our system integration with Accountable Care Organizations (ACOs) and Patient Centered Medical Homes (PCMHs) allows us to communicate patient-specific savings opportunities directly into their electronic health record (EHR) where the physician or office staff can act on them.

e-prior authorization

CVS/caremark was the first to introduce electronic prior authorization (ePA). This capability reduces what could be a 2- or 3-day process to a 2-minute decision that can happen in the doctor's office even before the appointment is over. It reduces stress for the provider and patient and gets the medication into the patient's hands more quickly.

Direct to the EHR

Prescription claims, or lack thereof, are a good indication of how well a patient is following prescribed therapy. CVS/caremark information systems flag when a prescription goes unfilled and when a refill is significantly late.

We can deliver that information directly into the patient's EHR so that the prescriber or office staff can contact the patient directly or discuss the issue at their next appointment. We can also provide practice- or plan-level adherence reports to Accountable Care Organization (ACOs) and Patient-Centered Medical Homes (PCMHs) to help them track performance.

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One-on-one counseling—because adherence is personal.

When Americans are asked who they trust, pharmacists consistently rank near the top.[11] That conclusion has been borne out in our own research and experience. A systematic review of published research on interventions clearly demonstrated that pharmacist counseling was among the most effective ways to achieve behavior change.[12]

The pharmacists who counsel members through our Pharmacy Advisor program have made a significant impact on adherence. Compared to control groups, 10 percent more members achieved optimal adherence with counseling through our Pharmacy Advisor program.[13]

Recognizing their value in terms of improving adherence, CVS Health undertook an enterprise-wide initiative to enable our pharmacists to provide the most effective counseling at CVS/pharmacies and through CVS/caremark call centers.

Face-to-face counseling by a pharmacist is 2–3x more effective at increasing patient adherence than other interventions.[14]

Counseling reminder for technician and pharmacist promotes engagement with consumer.

Carefully worded message to consumer more likely to lead to pharmacist counseling than "please contact us if you have questions."

Simple, easily understood messages relevant to the drug being dispensed enhance proper drug therapy.

Invitation to follow up with the pharmacist serves as another opportunity to promote counseling and adherence.

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Over the last several years, we've interacted with millions of members and have identified four broad factors that make counseling effective.

Counseling must be personalized

We built systems to identify when a member has a messaging opportunity—a late refill or a gap in therapy for example. That member's profile is flagged to prompt that communication. When counseling members, our pharmacists seek to identify and address the patient's specific adherence challenges—which could be cost, lack of understanding why the drug was prescribed, how to take it, or what its side effects may be and how to manage them. They also have information on hand to suggest solutions that will work for the individual, like a less expensive formulary option when cost is the adherence barrier.

Target efforts for the best response

We know that a one-size-fits-all strategy, such as late-to-refill interventions employed across a population, will improve adherence somewhat. However, based on results from pilot programs, we project that we can more than double our improvement by using predictive analytics to segment a population. Then we can shift resources to target the right interventions to the individuals most likely to respond using multi-channel communications.

More than

50%

of statin users stop taking medication in the first year.[15]

Reach members at the right times

High therapy drop-off rates tell us that a member's first month with a new prescription is critical. Not only do our retail pharmacists counsel members as they pick up the new prescription, they call two weeks later to make sure there are no questions or problems that could prevent follow-through on the prescribed regimen. Pharmacists at our call center make proactive outbound calls at key junctures, and inbound callers with targeted messages can be routed to our pharmacists for clinical counseling. Our systems monitor claims for members using either mail or retail to identify messaging opportunities throughout therapy.

Make counseling convenient

When a member is picking up a prescription or phoning in for a refill, their therapy is likely to be top-of-mind. Those occasions are prime opportunities for counseling, but we know messaging must be concise. The systems prioritize messaging opportunities according to clinical and plan priorities. In a single session, our intention is to deliver the message(s) deemed most important. On average, retail counseling takes less than two minutes. Calls from the Pharmacy Advisor team typically last about 10 minutes. The team asks about and notes the member's preferred day and time for outreach so they can time future calls appropriately. Importantly, all counseling is tracked and results are monitored so that we can continually improve systems and messaging.

The hard work of adherence at home.

46%

of all patients don't understand prescription dosing instructions.[16]

Regardless of their prescribers' expectations and their own intentions, the sickest people tend to be the least adherent. Of course, the adherence bar is higher for people like George. It's harder to take nine drugs a day than one or two. However, people with complicated drug regimens have to manage more than just their daily doses. They typically visit more doctors, suffer more side effects, face more potential interactions, and have more rules to remember *(do I take this with food or on an empty stomach?)*, not to mention more refills to order and more trips to the pharmacy.

Our research has shown that people with more social support—a spouse or partner, for example—are generally more adherent. However, the mere presence of another person isn't enough for consistent improvement. Practical support—providing a ride to the doctor's office, helping to organize prescriptions, or reminding the patient to take the prescribed medicine—was consistently associated with greater adherence, as was emotional support.[17]

Ironically, researchers have also found that caregivers, the people providing the practical support, are more likely to be non-adherent themselves.[18] With our focus on adherence, we at CVS Health are exploring how we can help patients receive support from family members, friends and through online social networks. In addition, we have developed our own forms of practical support as described below.

Let's make refills easier

We can help members transition from 30-day to 90-day prescriptions, set them up for automatic refills, and facilitate prescription renewals with their physicians—all of which help reduce the management burden for patients and caregivers. Our popular CVS/caremark mobile app provides refill reminders and lets a user scan the prescription bottle to order a refill whenever and wherever they are.

We are now testing methods of prescription synchronization.* Working with prescribers and patients, we align the timing of a member's prescriptions so that all medications can be picked up in one pharmacy visit or arrive in one package from the mail service pharmacy. Synchronization could also make it easier for prescribers; they'll be able to write all prescription orders at once.

*Currently being tested.

CVS/caremark mobile app: easy scan to refill process

1. Choose Easy Refill
2. Scan Bar Code
3. Review and Submit Refill

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Let's look at the label

Studies have shown that only half of patients understand the information on a prescription label. The content is complex, type is small, and the use of abbreviations can be confusing. At CVS Health, we have been refining our prescription packaging for some time, and our work continues with a focus on the needs of patients with complex regimens.

Some of the innovations being considered include:

- Bigger, more legible names of the patient and drug to help reduce confusion and accommodate patients with poor eyesight
- Simple charts and graphics to illustrate dosing and schedules—*2 pills twice a day*—points that are commonly misinterpreted
- Explicit instructions that incorporate graphics to help those with low literacy or English proficiency

Let's help at home

Forgetfulness is a common reason for missing a dose, and we're investigating a spectrum of reminder devices ranging from special bottles to countertop organizers. One pilot involves mobile apps that incorporate elements of gamification and provide "take your medicine" reminders. Members are rewarded points each time they comply, and points can be redeemed for gift cards or a charity donation.

The average person taking a statin visits the pharmacy 5 times a month.[19]

Research has shown that each additional dose a patient has to take in a day can reduce adherence by as much as 2 percent.[20] We're looking at how we can reduce complexity for the patient by consolidating dosages—potentially helping a patient reduce the number of times he takes medications from nine or 10 times a day to three or four. We are also looking at how to evolve prescription packaging.* Could we combine in one package the drugs that can be taken at one time? Solutions like these will make adherence less of a challenge for patients like George.

*Not yet commercially available.

We have a number of other studies underway evaluating the effectiveness of behavioral economics techniques in influencing health behaviors. Many of these studies are funded by the National Institutes of Health (NIH) or other federal sources and use rigorous randomized controlled methodology. In one study, we are assessing how to best employ financial incentives to create healthy habits. We are also conducting the largest study of financial incentives for smoking cessation in history, and we are exploring how social connections compare with financial incentives as a motivator of behavioral change.

In one study, one third of patients with 7 prescriptions dosed themselves 7 or more times a day.[21]

Who is more likely to be adherent?

- A patient with multiple Rxs
- Someone who lives in a high-income zip code
- Non-white patient
- Female patient
- Someone older than 65

Building a better plan for adherence.

Can plan design support better adherence? Our own analysis points to some basic assumptions. Ensuring access to lower-cost drug options helps overcome cost concerns. That can mean promoting generics or placing preventive drugs in specific categories or tiers at no- or low-cost.

90-day prescriptions mean fewer refills to order and fewer trips to the pharmacy, and we offer a variety of ways to make 90-day supplies available and prescriptions easier to fill. Plans that have adopted Maintenance Choice®, which allows members to access 90-day prescriptions at low mail-service pricing at CVS/pharmacy locations or through our mail service pharmacy, generally see improved adherence.[23] Similarly, Specialty Connect™ gives patients the option to pick up their specialty medications at their local CVS/pharmacy or receive them at home, in either case receiving the expert counsel of our Specialty CareTeams. In our Specialty Connect pilot, 50 percent of members preferred to pick up their medications at retail, and we saw a 13 percent improvement in adherence overall.[24]

Consumer-directed, value-based—the effect of cost share

Adjusting cost share to affect health behaviors is fundamental to benefit design. Over the last several years, plans have increasingly turned to consumer-directed plans, which typically combine a high-deductible and some form of spending account. These plans are intended to encourage thoughtful use of health services and reduce excessive use of expensive services such as the emergency room. As noted earlier, it's common to see adherence drop with the implementation of these plans.

Value-based insurance designs (VBID) take a different approach. VBID plans selectively lower costs for services that have been shown to be effective in improving outcomes and lowering overall costs. For example, a VBID prescription plan may lower costs for preventive drugs to increase member adherence.

It's common to see adherence drop with the implementation of a high-deductible plan.

This approach has been adopted by a range of CVS/caremark clients, providing us the opportunity to evaluate the effect of lowering or eliminating copays for specific types of drugs. In one recent study, our researchers looked at the effect of structural features of VBID plans, which can vary widely. For example, some reduce copays for all members using targeted drugs, some offer the reduction only to high-risk patients or to those who have enrolled in a disease management program.

Our analysis of 76 plans demonstrated that such structural features strongly influenced adherence levels. The researchers found a positive association between the generosity of the benefit, the availability of wellness programs, patient targeting and a requirement to use mail service pharmacy for the prescriptions. For these features the positive effect on adherence levels was as large as 4 to 5 percentage points.[25]

Estimated annual cost of non-adherence in the United States:

$290 Billion[22]

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Plan design factors that support adherence

Encourage use of 90-day prescriptions

Emphasize use of lower-cost drugs/generics

Make it easier for members to fill prescriptions

Consider cost share carefully

Build in options for high engagement counseling

In a second study, our researchers evaluated the impact of eliminating copays for select cardiovascular drugs—statins, beta blockers, angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs)—for patients who had suffered a heart attack. Compared to a control group, the members who received full coverage for these drugs experienced improved adherence and had fewer adverse events. We also saw a trend of lower overall health care spending.

Secondary analysis of the full-coverage group, however, provided additional insights. First, members in the full coverage group who achieved full adherence (≥80 percent) were as much as 30 percent less likely to have an adverse cardiovascular event compared to those who were non-adherent.[26] Secondly, non-white members who received full coverage had 35 percent fewer adverse events and lowered overall costs by 70 percent

Non-white members who received full coverage had 35% fewer adverse events and lowered overall costs by 70%.

Knowing that no single solution will work across a population, we have a long-term plan to invest and develop new ways to drive adherence, solutions that will help identify the individuals most at risk, predict their specific barriers and determine the most effective strategies for outreach and intervention. The research we do with our academic partners, the programs we pilot with clients and providers, our interactions with millions of patients and

Members who achieved full adherence were as much as 30% less likely to have an adverse cardiovascular event.

—an especially significant finding for a population group that has been shown to have higher rates of cost-related non-adherence and adverse events than white members.[27]

These studies point to the complex challenges of adherence and the need for targeted solutions that address the specific needs of the individual patient. For some patients, addressing the cost barrier may be sufficient. A patient like George, with multiple diagnoses and a complex regimen, needs additional support and solutions to make day-to-day adherence easier.

members—all reinforce our belief that targeted solutions deployed across key stakeholders and at critical junctures in therapy can bring our health system closer to the goal of optimal adherence, better outcomes and lower overall health care costs.

Mail pricing at CVS/pharmacy for eligible plans.
The Maintenance Choice program is available to self-funded employer clients and other eligible plans. Prices may vary between mail service and CVS/pharmacy due to dispensing factors, such as applicable local or use taxes.

Selected CVS Health Research Publications: Adherence to Medication

Clinical and Financial Impact of Medication Adherence

Comparative effectiveness of generic and brand-name statins on patient outcomes. Annals of Internal Medicine 2014 (in press).

Untangling the relationship between medication adherence and post-myocardial infarction outcomes. American Heart Journal, January 2014.

Cost-effectiveness of oral anticoagulants for treatment of atrial fibrillation. Circulation: Cardiovascular Quality and Outcomes, November 2013.

The Impact of Medication Adherence on Coronary Artery Disease Costs and Outcomes: A Systematic Review. The American Journal of Medicine, April 2013.

Impact of Medication Adherence on Absenteeism and Short-Term Disability for Five Chronic Diseases. Journal of Occupational & Environmental Medicine, July 2012.

Untangling the Relationship Between Medication Adherence and Clinical Outcomes. Presented at the Academy of Health Annual Research Meeting, Orlando, June 2012.

Medication Adherence Leads To Lower Health Care Use And Costs Despite Increased Drug Spending. Health Affairs, January 2011.

Use Of Generic Drugs In Prevention Of Chronic Disease Is Far More Cost Effective Than Thought, And May Potentially Save Money. Health Affairs, 2011;30(7):1351-7.

Value of Medication Adherence in Chronic Vascular Disease: Econometric Models of Health Services Utilization and Cost. Presented at the American Society of Health Economists, 3rd Biennial Conference at Cornell, Ithaca, NY, June 2010.

Claims Data Analysis — Understanding its Role in Adherence Measurement. Presented at the Medication & Treatment Compliance Forum, Washington, DC, October 2009.

Impact of Depression Medication Adherence on Health Services Utilization and Cost. Presented at the Western Economic Association International 84th Annual Conference, Vancouver, BC, June 2009.

Measuring Medication Adherence. Population Health Management. 2009; 12(1):25-30.

Medication Adherence, Health Services Utilization and Cost. Presented at the Ingenix Health Care Technology Conference, San Francisco, CA, May 2007.

Contributing Factors to Medication Adherence

Eliminating Medication Copayments Reduces Disparities In Cardiovascular Care. Health Affairs, May 2014.

Five Features Of Value-Based Insurance Design Plans Were Associated With Higher Rates Of Medication Adherence. Health Affairs, March 2014.

Group-based Trajectory Models: A New Approach to Classifying and Predicting Long-Term Medication Adherence. Medical Care, September 2013.

Patterns and predictors of generic narrow therapeutic index drug use among older adults. Journal of the American Geriatrics Society, September 2013.

Retail Clinic Utilization Associated With Lower Total Cost of Care. American Journal of Managed Care, April 2013.

Full prescription coverage versus usual prescription coverage after coronary artery bypass graft surgery: analysis from the post-myocardial infarction free Rx event and economic evaluation (FREEE) randomized trial. Circulation. 2013;128(11 Suppl 1):S219-25.

Methotrexate and Injectable Tumor Necrosis Factor Alpha Inhibitor Adherence and Persistence in Children with Rheumatic Diseases. The Journal of Rheumatology, January 2013.

Changes in Direct-to-Consumer Pharmaceutical Advertising following Shifts from Prescription-Only to Over-the-Counter Status. The Journal of the American Medical Association, September 2012.

Factors Influencing the Success of Value-based Insurance Design Programs. Presented at the Academy of Health Annual Research Meeting, Orlando, June 2012.

The Consequences of Requesting "Dispense as Written." American Journal of Medicine. 2011;124(4):309-17.

Full coverage for preventive medications after myocardial infarction. Post-Myocardial Infarction Free Rx Event and Economic Evaluation (MI FREEE) Trial. New England Journal of Medicine. 2011;365(22):2088-97.

Trouble Getting Started: Predictors of Primary Medication Non-Adherence. American Journal of Medicine, November 2011.

The Implications of Therapeutic Complexity on Adherence to Cardiovascular Medications. Archives of Internal Medicine, January 2011.

Revealed preference for retail and mail-service pharmacy. Journal of the American Pharmacists Association. 2011;51(1):50-7.

Adherence to Medication Under Mandatory Mail and Voluntary Mail Benefit Designs. American Journal of Managed Care. 2011;17(7):e260-9.

The Epidemiology of Prescriptions Abandoned at the Pharmacy. Ann Intern Med. November 16, 2010.

Value-Based Insurance Design and Antidiabetic Medication Adherence. Am J Pharm Benefits, February 2010.

Social and Demographic Factors

Gender and racial disparities in adherence to statin therapy: A meta-analysis. American Heart Journal, May 2013.

Association Between Different Types of Social Support and Medication Adherence, American Journal of Managed Care, December 2012.

Are caregivers adherent to their own medications? J Am Pharm Assoc. May 2011. [Epub ahead of print].

Interventions

Pharmacy-based interventions to reduce primary medication nonadherence. Presented at the Pharmacy Quality Alliance Annual Meeting, Washington, DC. May 2013; and at Society of General Internal Medicine Annual Meeting, Denver, April 2013.

Comparative Cost-Effectiveness of Interventions to Improve Medication Adherence after Myocardial Infarction. Health Services Research, December 2012.

Targeting cardiovascular medication adherence interventions. Journal of the American Pharmacists Association, May/June 2012.

An Integrated Pharmacy-based Program Improved Medication Prescription and Adherence Rates in Diabetes Patients. Health Affairs, January 2012.

Enhanced active choice: A new method to motivate behavior change. Journal of Consumer Psychology, October 2011.

An Employer-based, Pharmacist Intervention Model for Patients with Type 2 Diabetes. Am J Health Syst Pharm, February 2010. Erratum in: Am J Health Syst Pharm, April 2010.

Role/Impact of Health Care Professionals

Patterns of initiation of oral anticoagulants in patients with atrial fibrillation – quality and cost implications. American Journal of Medicine, in press.

Patterns of Medication Initiation in Newly Diagnosed Diabetes Mellitus – Quality and Cost Implications. The American Journal of Medicine, March 2012.

Physician Perceptions about Generic Drugs. Annals of Pharmacotherapy, 2011;45(1):31-8.

Modes of Delivery for Interventions to Improve Cardiovascular Medication Adherence: A Systematic Review. AM J Manag Care. 2010;16(12):929-942.

Physician Effectiveness in Interventions to Improve Cardiovascular Medication Adherence: A Systematic Review. J Gen Intern Med. October 2010. Epub May 13.

Effectiveness of Physician Alerts to Resolve Potential Gaps in Pharmacotherapy. Am Health Drug Ben. June 2010. www.AHDBonline.com.

Role/Impact of Technology

Online social networking by patients with diabetes: A qualitative evaluation of communication with Facebook. Journal of General Internal Medicine. 2011;26(3):287-92.

Variations in Structure and Content of Online Social Networks for Diabetics. Archives of Internal Medicine. 2011;171(17):1589-91.

Effectiveness of Healthcare Information Technology (HIT) Adherence Interventions in Cardiovascular Disease and Diabetes: A Systematic Review. AM J Manag Care. 2010;16(12 Spec No.):SP82-SP92.

Prescribing in Compliance with Patient Formularies Increases Primary Adherence in Patients Receiving Electronic Prescriptions. Presented at the SGIM 33rd Annual Meeting, Minneapolis, Minnesota, April 2010; and at the Academy Health Annual Research Meeting, Boston, June 2010.

Policy Considerations for Improving Pharmacy Care

Did HEDIS Get it Right? Evaluating the Quality of a Quality Measure: Adherence to Beta-Blockers and Cardiovascular Outcomes After Myocardial Infarction. Medical Care, July 2014.

Time series analyses of the effect of FDA communications on use of prescription weight loss medications. Obesity, December 2013.

Warnings without Guidance: patient responses to an FDA warning about Ezetimibe. Medical Care, June 2012.

Beneficiaries with cardiovascular disease and the Part D coverage gap. Circ: Cardiovascular Quality and Outcomes 2012;5(3):387-95.

Changes in Drug Utilization during a Gap in Insurance Coverage: An Examination of the Medicare Part D Coverage Gap. PLoS Med. August 2011.

Medicare beneficiaries' knowledge of and choices regarding Part D, 2005 – present. Journal of the American Geriatric Society. 2010; 58(5):950-66.

Changes in drug utilization and out-of-pocket costs associated with Medicare Part D implementation: a systematic review. Journal of the American Geriatric Society. 2010;58(9):1764-79.

State generic substitution laws can lower drug outlays under Medicaid. Health Affairs. 2010;29(7):1383-90.

Source Notes

1 Cassil, Alwyn. Rising rates of chronic health conditions: What can be done? Center for studying health system change 2008; no. 125.

2 CVS/caremark Enterprise Analytics 2008. Book of Business adherence metrics, Adherence to Care therapeutic categories, Q4 2007 through Q3 2008.

3 CVS/caremark news release, "CVS/caremark Focus on Medication Adherence Saves PBM Clients Nearly $2.4 Billion in 2011," May 2012.

4 Various sources including: Shrank WH, Choudhry NK, Fischer MA, Avorn J, Powell M, Schneeweiss S, Liberman JN, Dollear T, Brennan TA, Brookhart MA. The epidemiology of prescriptions abandoned at the pharmacy. *Annals of Internal Medicine.* 2010; 153(10): 633-40. Primary Medication Non-adherence, Journal of General Internal Medicine, online, February 2010.

5 CVS/pharmacy data, 2014.

6 Brown University/CVS/caremark collaboration, 2012, preliminary results as presented at CVS/caremark Client Forum, 2014.

7 Trouble Getting Started: Predictors of Primary Medication Nonadherence, American Journal of Medicine, November 2011.

8 Changes in Drug Use and Out-of-pocket Costs Associated with Medicare Part D Implementation: A Systematic Review, Journal of the American Geriatrics Society, September 2010.

9 The Consequences of Requesting "Dispense as Written." The American Journal of Medicine, March 2011.

10 Trouble Getting Started: Predictors of Primary Medication Nonadherence, American Journal of Medicine, November 2011.

11 Drug Topics, December 19, 2013.

12 Modes of Delivery for Interventions, American Journal of Managed Care, 2010.

13 CVS/caremark data, Pharmacy Advisor results, 2012.

14 Modes of Delivery for Interventions, American Journal of Managed Care, 2010.

15 Comparative effectiveness of generic and brand-name statins on patient outcomes. Annals of Internal Medicine, 2014 (in press).

16 Wolf, Davis, Shrank, Rapp, Bass, Connor, Clayman, Parker; To err is human: Patient misinterpretations of prescription drug label instructions. Patient Education and Counseling 67 (2007) 293-300.

17 Association Between Different Types of Social Support and Medication Adherence. American Journal of Managed Care. December 2012.

18 Are caregivers adherent to their own medications? J Am Pharm Assoc. May 2011.

19 The Implications of Therapeutic Complexity on Adherence to Cardiovascular Medications. Archives of Internal Medicine, 2011; 171(9): 814-822.

20 Helping patients simplify and safely use complex prescription regimens, Archives of Internal Medicine, 2011.

21 Helping patients simplify and safely use complex prescription regimens, Archives of Internal Medicine, 2011.

22 Thinking outside the pillbox, New England Healthcare Institute, August 2009.

23 CVS/caremark Analytic Consulting Services, Maintenance Choice Year One Impact on Medication Adherence, 2011.

24 CVS/caremark internal analysis, 2013.

25 Five Features of Value-Based Insurance Design, Health Affairs, published online February 2014.

26 Untangling the relationship between medication adherence and post-myocardial infarction outcomes. American Heart Journal. January 2014.

27 Eliminating Medication Copayments Reduces Disparities in Cardiovascular Care, Health Affairs, May 2014.

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