Now it's personal:
How data and analytics are humanizing health care

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You might imagine that when you experience a health crisis, your doctor carefully considers your medical history, family history and lifestyle when weighing diagnoses and treatments. In fact, aside from high-level considerations like age and gender, that's often not the case. Traditionally, diagnoses are one-size-fits-all, and optimal treatments are determined through trial and error. In medicine's early days, that was the best we could do…

If you had cancer, the location of the growth would determine your treatment. Then we discovered that cancer comes in different genetic subtypes, with distinct progressions and treatment protocols. Today, doctors no longer treat all cancers the same.

Medicine is beginning to acknowledge that not all patients are the same either. The biological, psychological and social factors that led to your disease are not those of the person next to you in the waiting room. And those factors impact how you'll respond to treatment and your risk of complications.

Personalized medicine refers to the customization of medical decisions to the individual patient based on their DNA, medical history, family history, environment, behavior, culture and values. The goal is to find the most effective approach for a particular patient— which is often the most cost-efficient approach as well.

We all know that U.S. health care spending is out of control. America spends two to three times more than most developed countries, and with worse results. The Centers for Disease Control and Prevention (CDC) estimates that 90% of the nation's health spending goes to chronic and mental health conditions.[1] Prevention and proper management can greatly reduce these costs.

In this article, we'll explore how personalization is lowering health spending through a focus on early intervention. We'll examine the data inputs and analytic tools making those interventions possible. And we'll show that, while traditional

care *de*humanizes, personalization *re*humanizes, resulting in a better patient experience.

The Angelina Jolie effect: What you need to know about genetic testing

In 2013, Angelina Jolie famously revealed she'd undergone a preventive double mastectomy after testing positive for the BRCA1 gene variant. Her story spurred a dramatic increase in genetic health tests. In the 15 days after her essay appeared in The New York Times, testing for BRCA1 and BRCA2 spiked 64%, translating to an extra 4,500 tests among U.S. women.[2] DNA health testing had gone mainstream.

Genetic screening for use in health risk assessment, diagnosis and treatment is sometimes referred to as "precision medicine." Since 1998, Aetna has been a key player in developing **best practices** around genetic testing while advocating for **wider access** to genetic services, protecting **patient privacy** and promoting **nondiscrimination policies.**

"One of the most important jobs a health plan can perform is to make sure our members have access to the tests that have a clinical benefit," says Heather Shappell, a board-certified genetic counselor who manages Aetna's Precision Medicine program. "There are tests that might be available —and even marketed pretty extensively—that really don't have any proven value." Aetna covers thousands of genetic tests for its members.

1   CDC. 2019. https://www.cdc.gov/chronicdisease/about/costs/index.htm#ref1
2   Aetna International. "Bespoke health promotion: How personalization is transforming health." 2018. https://www.aetnainternational.com/content/dam/aetna/pdfs/aetna-international/Explorer/health-care-personalisation.pdf

Experts usually recommend genetic testing only when a patient has a specific medical reason, such as a family history of certain cancers. Genetic counselors, like those promoted by Aetna, can steer patients toward the high-quality tests that are appropriate for them and thoroughly explain how the results might shape future health decisions.

While media coverage tends to focus on the role of genetics in cancer diagnosis and treatment, DNA testing can measure thousands of different health risks. In October 2018, for instance, the American Diabetes Association (ADA) published a study[3] on the promise of precision medicine in the prevention and treatment of type 2 diabetes, the most expensive condition in the U.S. Approximately half the people with type 2 have a genetic predisposition, indicating there are subtypes with different progressions and risks for, say, kidney disease and coronary artery disease. In 2017, diabetes cost Americans about $237 billion in direct medical costs.[4] Early intervention has the potential to save upwards of $100 billion per year.

Although the use of genomics in diabetes treatment is some years off, the study's authors predict a rapid evolution of new treatment regimens that "are more effective, less costly, and convey fewer unnecessary side effects." Aetna's comprehensive approach to precision medicine positions the company to take advantage of new genetic technologies and services while controlling medical costs.

As you can see, personalization shifts health care's focus **upstream**, from reactive crisis management to **prediction and prevention**. In this way, the approach is more aligned with **patient values**. After all, we tend to go to the doctor because of symptoms that affect our **quality of life**. The future of health care will be about extending not just our lifespan, but our **healthspan**: the years when we are in generally good health and able to enjoy life on our terms.

Annual direct and indirect cost of diabetes[5]	In billions of dollars
Hospital in-patient treatment	69.7
Prescriptions to treat complications	71.2
Reduced productivity	27
Increased absenteeism	3.3

Read more about how precision medicine improves the patient experience:

· A quick guide to Aetna's Precision Medicine strategy

· 6 things to know before you get a genetic health test

· Patient story: A mother and daughter fight breast cancer together
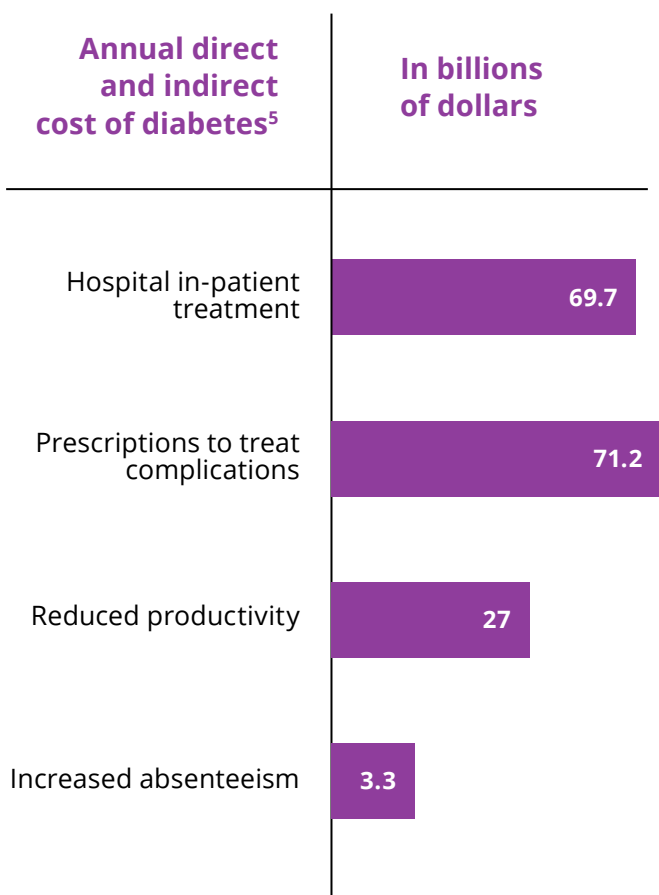
3 American Diabetes Association. "A global overview of precision medicine in type 2 diabetes." 2018. http://diabetes. diabetesjournals.org/content/67/10/1911

4 American Diabetes Association. "The cost of diabetes." 2018. http://www.diabetes.org/advocacy/news-events/cost-of-diabetes.html

5 Ibid.

The art of the nudge: Wearable tech helps drive behavior change

Like genetic testing, wearable devices introduce a whole new data stream to medical decision-making. Wearables can provide doctors with real-time information on activity levels (exercise, sleep patterns) and vital signs (heart rate, blood pressure, breathing, blood-sugar levels) that allow for early detection of problems and personalized interventions. Some devices even nudge users to take healthy actions, like going for a brief walk if they've been sedentary too long, or de-stressing with a mindful moment.
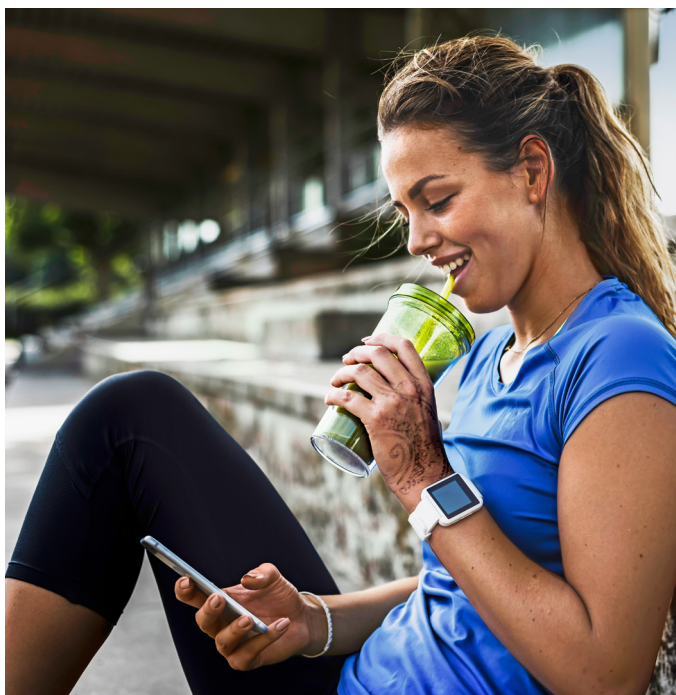
In January 2019, Aetna announced the **Attain by Aetna℠ app** in collaboration with Apple®. A first-of-its-kind health tool, the technology combines members' health history with their Apple Watch activity to offer personalized, achievable goals. The recommendations go way beyond fitness to focus on the actions that boost health outcomes and productivity, thus lowering costs: Users may be encouraged to get a flu shot, refill a prescription or switch to an in-network lab. When they follow through, they're rewarded with gift cards to top retailers. But businesses will enjoy the real rewards: The flu cost American employers approximately $21 billion in lost productivity for the 2017-2018 flu season.[6]

Wearables tap into many of the psychological techniques that keep us reaching for our phones. Gamification and social competition can be powerful motivators that maintain member engagement over the long term. Wearables also enable health care systems to gather anonymized data in order to predict trends and test appropriate interventions (more on that below).
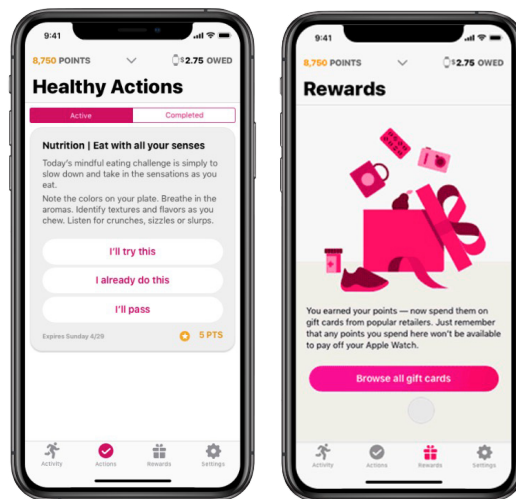
Learn more about the Attain by Aetna app.

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What's blockchain got to do with it: The benefits of electronic medical records

In theory, your entire medical history should live in the cloud, accessible by any health provider who needs to reference or add to it. In reality, each doctor or facility you visit has part of your medical record, but very few have access to all of it, due in large part to incompatible platforms.

This fragmentation of patient records leads to waste and medical errors. In 2012, the National Academy of Medicine estimated that waste accounts for 25% of all U.S. health spending each year, or $765 billion.[7] Doctors frequently order duplicate tests because they can't see results from labs ordered by other offices. Worse, patients seeing multiple doctors can be prescribed medications that negatively interact with each other, leading to serious side effects and delays in treatment.

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6   Challenger, Gray & Christmas, Inc. 2018. http://www.challengergray.com/press/press-releases/update-2-flu-season-cost-employers-21b

7   National Academy of Medicine. "Roundtable on value & science-driven healthcare." 2012. https://nam.edu/wp-content/uploads/2017/12/Briefing-Book_Combined.pdf

The means to assemble disparate patient records into a single history has been elusive. The answer may lie in the world of cryptocurrency. **Blockchain** is a technology that makes sense of decentralized information while maintaining security. Having proven itself capable of protecting bitcoin owners, blockchain is poised to save the U.S. $7.9 billion in duplicate laboratory and radiology tests attributed to lack of data sharing.[8]
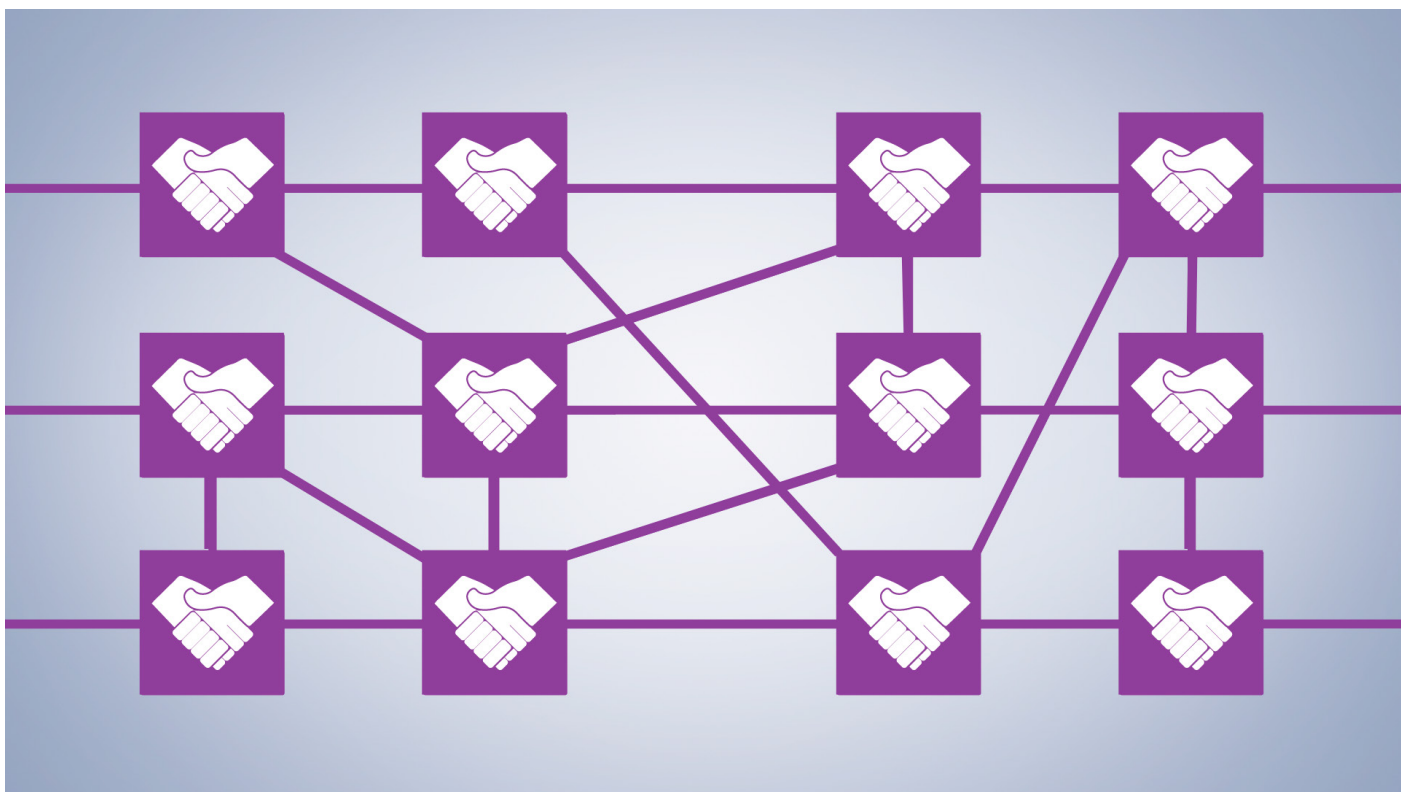
In early 2019, IBM announced a collaboration with Aetna and other companies to test out a version of blockchain called Hyperledger Fabric. The system would collect, streamline and standardize medical record keeping. "Blockchain has the potential to produce an information ecosystem that finally connects all of the health players," says Claus Jensen, chief technology officer for CVS Health and Aetna. "My ambition is to position CVS Health as an information hub for the health sector as a whole."

By allowing for easy data sharing between providers, blockchain should reduce inefficiencies and errors. It could also address other health system challenges, from processing claims and payments to maintaining accurate provider directories. "The greatest promise of blockchain," adds Jay Rajda, MD, Aetna's senior medical director of medical affairs, "is the ability to make more complete information available in a more timely fashion at the point of decision-making. Better information leads to better clinical care. And you're going to improve the consumer experience tremendously."

The AI advantage: Transforming data into actionable insights

Personal data is merely raw material. Artificial intelligence (AI) is the computer brain that spins it into valuable insight. Studies show that pattern-recognition programs can help diagnose disease with greater speed and accuracy than humans alone. Algorithms are beginning to point doctors to the best treatment protocols. Most significantly, predictive analytics are flagging which individuals are at the highest risk for developing serious conditions—once again, shifting the focus of health care upstream to prevention.

8   "Value of information sharing in reducing health care waste." 2014. https://pdfs.semanticscholar.org/8b95/ dc6a2970e0b61bb56f5bd560b4956aef34c7.pdf

Launched in 2018, **Aetna's Next Best Action initiative** encourages individuals to take one small step at a time toward achieving a healthier life. The term *next best action* refers to the use of a customer's data (past behavior, preferences, etc.) to guide him or her toward certain decisions or services. Digital companies like Amazon and Netflix have been doing this for years with their recommendation engines. In health care, the simpler and more specific each ask is, the more likely the member is to complete the action.

Below, you'll see how one Aetna program uses health records and data analytics to solve real-world problems for a fictional member named Greta. The goal is early intervention, which keeps people healthier while reducing medical costs. The Next Best Action initiative taps into a $250 million-plus margin opportunity, even when targeting a small fraction of the fully insured Aetna population.

Artificial intelligence, real results

1. Patient analysis	Examines what an individual has done in the past.	Greta, who has diabetes, skipped her annual checkup last year. That's a red flag because…
2. Cohort analysis	Looks at groups of people like that individual to predict what they'll do in the future.	People with diabetes who miss an appointment have a higher risk of complications. But why did Greta miss her appointment?
3. Behavioral modeling	Reviews the individual's activities, interactions and environments to learn why they do what they do and what types of intervention will motivate them to change.	We know that Greta previously requested help with transportation to the doctor.
4. Predictive modeling	Targets specific behaviors and actions based on the potential impact on health and cost savings.	A pilot program in Greta's area offers free rides via Lyft for medical visits.
5. Targeting	Personalizes the messaging, timing and delivery channel to maximize impact.	Greta receives an email about the transportation offer, which is redeemable within 90 days. But will she take advantage?
6. Iteration	Measures and refines pathways to improve engagement for next time.	Aetna gets a claim from Greta's doctor, confirming she made it to her appointment. If she hadn't, different messaging would be tried.

Customer service is another area where AI can create a more personalized experience. The Aetna Concierge program gives call-in centers enhanced data to address callers' needs quickly and easily. For instance, if a caller is looking for information on virtual care, the rep is alerted that the caller has children. The rep then knows to inform the caller that Teladoc service provides access to board-certified pediatricians. Because member needs shift over time, the algorithm reevaluates what's important to individuals every month.

The benefits to health and the bottom line

Effective personalization is proven to reduce adverse side effects and hospitalizations. With 90% of health spending going toward chronic conditions, the potential economic savings are staggering. Averting complications from diabetes alone could save Americans over $100 billion in savings each year. And given the $765 billion that's wasted annually, reducing duplicate testing and other inefficiencies could save many billions more.

Cost savings aside, personalization aligns success more closely with patient values and health goals, making individuals feel recognized and understood. That results in better patient participation, compliance and satisfaction. By treating each patient as a unique person rather than just a diagnostic label, we can rehumanize the health care system.

"I see more and more algorithmic work being taken off the primary care doctor's plate so that they can spend more time with the patients who need them the most," says Troyen Brennan, MD, chief medical officer of CVS and Aetna. "Diabetes, high blood pressure, high cholesterol, depression, asthma — all lend themselves to a personalized approach that is more efficient and less expensive."

To learn more about how your organization can benefit from Aetna's personalized offerings, contact us.

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