RESULTS

THE FUTURE OF PHARMACEUTICAL AND HEALTHCARE MARKETING

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CHAPTER 3

PROMISE OF BIG DATA

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THE ERA OF BIG DATA, IN WHICH WE HAVE UNPRECEDENTED ACCESS TO AN AVALANCHE OF INFORMATION, CAN CHANGE FOREVER HOW WELL WE, AS A SOCIETY, MANAGE OUR HEALTH. BY TAPPING INTO IT, THE LIFE SCIENCES INDUSTRY HAS THE ABILITY TO HELP PEOPLE AND TO HELP ITS BOTTOM LINE IF IT CAN SUMMON THE WILL TO DO SO.

Every 15 minutes, we generate the same amount of data globally as we did from the beginning of recorded history through 2005. Not since Gutenberg’s printing press has society seen such a momentous shift in our ability to record data. The printing press changed the world, but that hardly compares to the staggering potential of the era of big data we’re in now.

A popular term these days, big data, in essence, refers to the enormous volume of information and our ability to access it and analyze it in ways never before possible, thanks to advances in high-performance computing. No longer are we limited to sampling small subsets to draw insights and piece together the big picture. In the world of
big data, we come closer to actually seeing the entire picture as we navigate the avalanche of data.

Today we can store vast amounts of data at a much lower cost, and the information comes from a multitude of sources. Think about the volume of social media chatter and the increasing number of devices, such as activity trackers, smart watches, video cameras, and smartphones that capture, feed, and share data. The Internet of Things (IoT), with its estimated 25 billion connected devices that are rapidly increasing in number, will continue to drive this tremendous growth in data volume that is available for capture and analyses.

Some of that data is structured but most is unstructured. By structured, I’m referring to information that’s shown in a chart or table; it’s formatted and recognizable, arrayed in columns with letters and numbers. By contrast, unstructured data is what we find in places such as social media, in posts and tweets, and wherever else people leave information—whether an idle thought, a complaint, a shrewd observation, or just an emoticon. Unstructured data is free-form and untamed and yet, often holds valuable insights about attitudes, perceptions, and behaviors.

We know how to approach structured data; we have a history of analyzing it. But the analysis of unstructured data is relatively new. One would think that a smiley face attached to a message would be of significance only to the immediate recipient. Perhaps not. There are ways to tap into Facebook and Twitter feed data and the like, gather it into an analytics environment, and then mine it for valuable information. Today we have software that can glean the meanings from natural language. It can tell from the context, for example, whether the word “light” refers to luminescence or weight. The software is able to discern differences based on the structure of a sentence.
Further, the information itself is constantly changing, which makes it that much harder to understand and analyze. The percentages of structured and unstructured information in data feeds change regularly, with new types of data, not previously analyzed, introduced throughout the process. This makes the task of analysis more difficult but certainly not impossible. In fact, the pharmaceutical industry is already harvesting more refined insights from this mixed and massive volume of data.

Fortunately, new data management capabilities can handle these enormous and complex data sets. There are analytics capabilities for the business analyst and visualization solutions for data exploration. More professionals than ever before will be able to make use of data because all corporate teams will work to identify business opportunities.

Empowering more employees with the right tools will allow for more and faster insights: “Analysts working on big data need a seamless integration of data management, data visualization, and advanced modeling capabilities that, in turn, enable them to identify the appropriate data, prepare the data, iterate on multiple hypotheses, and attain insights faster. Time to insights is decreased when these capabilities are brought together in an intuitive workflow and design interface for the user,” says Jamie Powers, senior industry consultant and big-data authority at SAS.

SEIZING THE OPPORTUNITIES

Some people find it unsettling, or even frightening, that such a huge amount of information can be tapped to reveal so much about each of us. It may seem Orwellian, as if Big Brother is watching.
The industry needs to take note of that attitude, since the public is not particularly trusting of the industry in any case. Some people unfairly blame it for contributing to the rising cost of healthcare, while politicians malign the industry. It is clear that pharma needs to work harder to develop trust with many consumers and patients.

By accessing big data, pharma can gain insights on the market and how to best interact with consumers. It can find ways to battle those negative perceptions and turn them around. By analyzing the information that big data makes available, the life sciences industry has an unprecedented chance to change those perceptions in the marketplace.

Slowly, pharma has been embracing social media analytics and leveraging big data. With a herd mentality, participants are wading into the murky waters. The opportunity is significant for gaining insights on branded products, therapeutic categories, and competitors’ brands. Pharma can encourage feedback, both positive and negative, from patients and providers. In doing so, it can address issues that arise and protect corporate reputations.

Unfortunately, unfounded concerns linger around the reporting of adverse medical events that surface during social media analyses. Actually, less than 0.01 percent of adverse events on social media meet the requirements for reporting. Nonetheless, much of the industry has yet to participate in this social listening and to gain real advantages of basing decisions on hard data rather than on speculation.

In addition, other more impactful opportunities are available to pharma with big data. For example, companies can assess patients’ ability to manage their own health and can enable and support them in doing so. The data can help the industry understand where
resources should be targeted for the best outcome and greatest good for a patient population.

Pursuing these opportunities requires pharma to be more assertive. Two things need to occur. First, the life science companies must, to a degree, reinvent themselves. This involves redefining their commercial model of what they are selling, whom they are selling it to, and how they go to market.

Second, to reinvent themselves they need to foster changes in the regulatory environment that allow for collaboration with other entities across the healthcare continuum. Current regulations and the ultra-conservative way in which the companies interpret them have been roadblocks to substantive changes in the commercial model that would allow pharma to capitalize on big data.

IDENTIFYING PATIENTS AT RISK

As a senior healthcare consultant, I work in an innovation center, created by SAS, a large software company based in Cary, North Carolina. At SAS we looked at what was happening in the healthcare market in this era of reform and created an incubation and prototyping team, the Center for Health, Analytics and Insights (CHAI). Earlier in my career, I was an independent consultant to the pharma industry for a number of years. Before that, I worked for a large database marketing company, managing three of its largest biopharmaceutical clients.

At SAS, I deal with the three verticals in healthcare: life sciences companies, providers, and health plans. CHAI started with 17 people recruited from those three verticals, with the goal of devel-
oping software capabilities with which the industry could prioritize allocation of resources.

Our team focuses on developing ways to identify which patients are at highest risk of a medical event. To a large extent, this also involves an analysis of patient adherence (how likely patients are to continue to take their prescription therapy as their doctor prescribes).

For example, let’s say two patients, Tom and George, have the same chronic disease, are in the same stage of disease progression, and are on the same treatment regimen with the same doctor. However, Tom is predicted to be twice as likely as George is to have a critical care event or progression of the disease. The doctor and health insurer will want to allocate more resources—more hand holding, if you will—for Tom, knowing that George’s risk profile is lower and that George appears to be more self-sufficient. George doesn’t need a nurse calling to urge him to show up for his appointment next week. He doesn’t need a care manager or his health coach to remind him to walk three miles every other day. But Tom needs those calls.

At SAS, we’re focusing on developing software to help life sciences companies, healthcare providers, and health plans to identify such at-risk patients, and to develop psychosocial profiles for those patients so that resources can be best allocated in a manner that is meaningful and effective. The goal is to develop the engine that selects the right intervention for each patient at exactly the right time to enable a sustained behavioral change. There is a breadth of new data assets that are now being analyzed to better understand the many facets of patients and their behavior.
BIG DATA SOURCES

Let’s look at some specific sources of big data and how we can make the most of the available information. In short, here’s what is needed: the data, of course, which will provide the insights; an IT infrastructure; analytical software; human resources (meaning the people who will gain the insights); and a clinical or business operation to use those insights effectively. These all must be put into place, and that can readily be done now. The data is valuable in understanding, predicting, and ideally, changing patient behavior. The smart money in this era of US healthcare reform is being placed on changing patient health outcomes.

With the volume of personal information available today, some wonder whether the data can be mined for personal tidbits or just for trends. Of the types of data that I list below, some can be licensed at the individual level. Other information is only licensable provided no specific individual is identified, which means someone can see your data but cannot identify you, personally, as the origin of such data.

And what are the data sources for the healthcare industry? Here is a rather comprehensive list:

- Socioeconomic behavioral data, obtainable from companies such as Epsilon, Experian, and FICO.
- Prescription claims data, which is information about the scripts you fill at your pharmacy. Companies such as IMS Health and Symphony Health Solutions provide that data.
- Electronic medical record (EMR) data is all the information that physicians, pharmacies, or hospitals collect about a patient that can shared in an EMR.
- Lab data, such as information from diagnostic tests.
- Patient registries data: hospitals or providers can capture information about patients with a particular disease and track how their conditions progress over time.
- Social media data coming from sources such as Facebook and Twitter.
- Health plan claims data is data from a health insurer that has a good view of prescriptions filled and diagnostic tests performed. This information does not show results, which are captured in the lab data and the EMR.
- Medical device data, such as from a blood glucose monitor: the sensor data indicates, for example, how frequently patients check their blood glucose level and the results of those tests. Additionally, there are a dearth of new biometric devices streaming data (e.g. blood pressure monitors and wireless scales).
- Health device data: today there is a multitude of mobile technologies such as activity trackers, smartwatches, and fitness apps for smartphones that monitor and capture data. Fitbit and smartwatches will produce significant amounts of activity data into the future.
- Patient support or intervention program data is collected from the interaction a patient has with the program, such as communications with a health coach or text message reminders to fill a prescription.

By combining these data sets to create a composite profile of a patient both inside and outside a clinical setting, we can identify untapped opportunities to administer appropriate care. We will start to see the
impact of environmental, psychosocial, and behavioral aspects to disease management and be able to proactively stratify patients based upon risk of a future medical event.

The final source of data on the list, patient support or intervention program data, is becoming increasingly important and will drive specific interventions for specific patients. A major healthcare focus will be on behavioral change. How do we get patients to change their behavior, such as follow a better diet, exercise more, or take their medication twice a day after meals? Historically, the healthcare industry has not been very successful in driving patient behavioral change, as evidenced by the adherence rates in treating obesity and type 2 diabetes, both of which involve lifestyle factors.

Medical personnel have been telling patients to lose weight, exercise, and eat better, but the industry has not done a good job of assessing what works and what doesn’t in changing behavior and for whom it works. For example, if we can determine that peer support groups work best for people with a certain profile, we should work harder to establish such groups for those people.

To help crack the code on patient behavior change, we need to combine and mine the data sources to drive targeted interventions for specific patients. This a sizable part of the US$40B population health management market projected for 2018 (Markets and Markets, Population Health Management Market, 2014, report). The “patient behavior change” market has been referred to as the next billion-dollar blockbuster (drug) market. Patient behavior change is a core component of the population health management market. If we are unsuccessful at supporting sustained patient behavior change, the goal of healthcare reform will not be realized. Life sciences is interested in the population health management market for two reasons:
1) changing patient behavior will include getting patients to be more adherent, which is a tremendous problem for life sciences, and 2) life sciences are trying to figure out how to have a meaningful role in population health management since it will significantly change our healthcare system.

THE MAJOR CHALLENGES

The biggest challenge for the life sciences and pharma industry is in driving innovation in this area. Using big data, the industry can identify opportunities to deliver something new to the market where there is a need.

With healthcare reform, life sciences companies will need to show an improvement in patient outcomes and show that what they are offering is cost effective. They’ll need to prove it is a better outcome for a patient at a particular cost versus something the competition is doing. Health economics and outcomes research (HEOR) groups within life sciences companies do this today. They are working with big data to identify insights that quantify the outcomes and cost-benefit value of their drug versus that of the competition.

Market competition has increased on two fronts. First, many of the blockbuster drugs have gone off-patent. From 2010 to 2015, an estimated $130 billion in branded drug sales was lost to generics. Generics are forcing life sciences companies to step up their research and development. But many of the new drugs are for smaller patient populations and hence are demanding significantly higher prices. One example is the 12-week regimen for hepatitis C at a cost of over $80K. Although this particular drug does have a strong financial-to-outcomes proposition, the sustainability of these types of pricing
models is in debate. Considering that the rest of healthcare is moving
to fee-for-value, one would suspect they are not sustainable, espe-
cially when other treatment options are available. This will push the
industry to reinvent its business model, although at this time, most
of the companies have not.

Another challenge for pharma then, is to build that new commercial
model. I have talked with a number of innovation teams at pharma
companies. These folks devise good, insightful ideas. But historically,
the organizational culture has not embraced and invested much
in those new ideas because they have not had to do so. Pharma
has been incredibly profitable for half a century or more. Once a
company secured a molecule under patent and started selling in a less
competitive or exclusive market, it could often take a price increase
if it was concerned about making its revenue number the next year.
Why then, would a company turn its business model upside down
when it was always going to satisfy Wall Street? The industry had no
incentive to change its business model. However, in other industries,
big data has enabled a few entrants to redesign the entire market—
think travel, with Expedia and Priceline; think financial, with eTrade;
and retail, with Amazon.

A third major challenge is to change the thinking of mid level pharma
management to harness change. For example one pharma company
explored new commercial business models but was unsure whether
its employees, some of whom had been in the industry for 20 years,
would adjust and get on board with new roles and a new direction.
Would the staff have the entrepreneurial mojo to forge ahead both
internally and externally?

It doesn’t appear that the company ever made any substantive changes.
It’s unclear whether its legal advisors slowed down the initiatives, or
stopped them, or whether there has been concern at the very top of the organization about fundamentally changing the business model or expanding on innovative plans.

**Wake-up Call**

Nonetheless, the fact that companies are setting up innovation centers shows they recognize the potential. The industry needs to be aware of how reform measures are altering the nature of healthcare. We are moving from fee-for-service—the system whereby physicians get paid whenever they see a patient or do a procedure—into a fee-for-value system, under which the providers earn money by ensuring that the patient gets better. If the patient doesn’t get better, the provider and/or payer makes less money or doesn’t get paid.

*This is a major industry shift. As health plans and providers take on more financial risk through their contracting, they will seek to share that risk with other entities across the healthcare value chain. It’s very likely that pharma will soon find itself facing the same value scrutiny in the US that it is already facing globally.*

With the creation of health information exchanges and other comprehensive healthcare data repositories, the holistic view of patients’ treatment pathways in a real-world setting will empower providers and health plans with insights into drug and therapy performance. In crowded therapeutic categories, the formulary gatekeepers may further reduce coverage on high-cost therapies when lower-cost alternatives with equal clinical outcomes exist. These concerns are emerging across the industry.

“Imagine aggregating say cholesterol levels of every patient who’s taking your statin drug and really understanding
how the drug is working in the real world. We would need to control for all of the factors that need to be controlled for on a large scale like disease severity, age, comorbidities, and these types of things. But this big data set would allow us to really understand if the drug is really effective, and if not, the data may perhaps explain why. “Real world data is scary to some companies because it may not show that their product is best. In reality there’s no such thing as best, there is only what is best for an individual patient."

—Lars Merk, Portfolio Marketing Director of Diabetes Franchise, AstraZeneca

And with advances in software and computing power, there are new high-performance analytic solutions that support the analysis of tens of millions of rows of data in a fraction of the time that it formerly required. Additionally, advances in data visualization allow for exploration to realize more insights even faster. The big data sets combined with these advanced analytic capabilities start to set the foundation for precision medicine. Precision medicine refers to the tailoring of medical treatment to the individual characteristics of each patient. This is accomplished by segmenting a patient with a particular disease/condition into subpopulation cohorts that differ in their response to a specific treatment. Patients within cohorts receive the treatment regimen that has been optimized for their particular circumstances.

Given the scenario presented above for the status drug, what if negotiations with providers or health plans turned into small,
branded, volume purchases for select, targeted cohorts of patients who are predicted to not respond to other lower-cost therapies?

The rapid development of the breadth and depth of data to enable analyses like these has been noted by a leader in big data insights: “We leverage big data capabilities to create actionable intelligence,” says Tom Henry, vice president of knowledge solutions for Express Scripts. In serving the pharmacy needs of nearly 90 million members, he says, the company generates demographic, environmental, psychosocial, behavioral, and health data. “Our advanced analytic capabilities produce unique insights that help patients and clients make better decisions and achieve healthier outcomes.”

Unfortunately for pharma, challenges are also emerging from entrants outside the industry. Because the changes within US healthcare are so significant and truly daunting, other industries that were not previously involved in healthcare are seeking a role in helping patients or providers make that behavior change and improve outcomes.

The lesson is this: If pharma and life sciences companies don’t step up, they may be left out. At this time, at least four companies serve as examples.

- Apple recently launched HealthKit, its new software platform for collecting data from various health and fitness apps. This composite view can include data such as heart rate, blood pressure, body temperature, weight, blood glucose, distance walked, steps climbed, and other data from the myriad of apps from third-party developers. HealthKit also has been designed to share data with provider organizations. Imagine the volume of data streaming from Apple’s 73 million iPhone users in the USA as they upgrade
to the iPhone 6 with HealthKit. It will be a treasure trove for providers or any company looking to enter the patient engagement or population health management market. Who would have thought that Apple would participate in healthcare? But if Apple does successfully enter the field and become a competitor with anything your company is doing or could do, you should be concerned. Why? Because Apple understands the value of leveraging big data and disrupting markets.

✦ Sony is entering the medical device and diagnostics market. In short order, diagnostic imaging data, streaming medical device data, and a portfolio of smartwatches will position Sony as another major entrant in healthcare with access to the big data trove.

✦ Ford has been working on capturing consumers’ biometric data. Sync, an on-board health monitor, captures a driver’s biometrics and makes recommendations on driving routes to accommodate the driver’s need to stop for an insulin injection. Additionally, it can send phone calls to voicemail so the driver can focus on driving in times of high stress.

✦ Google, in one of its top five strategies, is helping consumers and patients better manage their health by launching a free trial of live chat with doctors. This is done when a consumer conducts an online search for symptoms. The data from search history, if combined with the text from the video chats, can yield tremendous insights into predicting the spread of disease, helping triage patients faster and less expensively, and getting high-risk patients to a provider more quickly.
With such giants now entering the healthcare arena, the pharma industry should take notice. The competition is intense, immense and moving quickly. Apple and Google are companies that understand the concept of big data. They have developed new industries with disruptive technologies. They have reinvented industries and are dominating them, in large part due to their understanding of the potential of big data. Amazon certainly gets it, as it predicts what you might buy based on your profile and what you have bought in the past, as well as what people with similar profiles have purchased. That concept could be applied incredibly well to driving changes in patient behavior.

And these companies have figured out how to scale things. The iTunes store and Amazon are now looking at delivering fresh groceries. Both Apple and Amazon are incredibly adept at scaling their organizations into new markets. Life sciences companies today don’t very often work directly with patients. To do so, they would need to find a way to scale their operations very quickly. There’s much to learn from the consumer giants who are adept at catering to consumers very well.

This is a wake-up call, and pharma needs to hear it.

It is not that pharma companies don’t want to do more; it’s that they have not been motivated because they have been incredibly profitable. And again, the industry is naturally conservative, partly because of regulations and how the company’s legal teams interpret them.

I recently attended a big data conference where a biotech representative offered some insight into the company’s challenges. Essentially, the company wanted to provide more targeted support to patients and wanted both the patient and doctor to get involved actively.
A company representative visited Capitol Hill to seek a change in regulations and get some FDA feedback.

I’d like to see the industry do more of that. If a pharma company comes up with innovative ideas that appear to run counter to current regulations but that benefit the patient, provider, and others in healthcare—while keeping costs down, I think it should send people to Washington, D.C. to make their intentions clear and advocate for change.

**Mapping the Patient’s Journey**

The life sciences industry has spent a fortune on research to understand how patients conduct their lives. It has done a tremendous amount of primary and secondary market research to develop complex patient segmentation models within most of the major disease categories. These segmentation models are valuable assets that can work in tandem with big data.

Segmentation models can be based upon defining patient attitudes, needs, and behaviors and how all three of those relate to prescription drug adherence. The models are being developed so life sciences companies can identify which people can be persuaded to change their behavior and adhere to therapy. The companies want to know where their investment of patient support resources will do the most good.

Other market researchers have looked at understanding a patient’s journey from the initial symptoms to the decision to see a doctor to going for tests to returning to the doctor for a diagnosis and coming to terms with that diagnosis and starting a treatment plan. The patient
comes to a resolution or seeks a second or third type of treatment or ongoing treatment if the condition is chronic. The research maps the clinical, mental, and emotional aspects of the patient’s journey.

One reason to map that journey is to identify opportunities to engage patients when they are particularly receptive to more information or behavior change. The idea is to reach them at a critical juncture with information that might drive them to ask their doctor about a particular type of treatment or option.

These are some of the richest insights into how patients live with specific diseases and the daily challenges they face in balancing demands of family, work, and community. That knowledge provides a context for managing yet another daily demand of an acute or chronic condition. Pharma understands where, when, and why patients fail to adhere to their treatment regimens and make sustained lifestyle changes.

**EXPANDED OPPORTUNITIES FOR PHARMA**

Let’s take a closer look at the opportunities for the pharma industry to take advantage of these unique assets in this age of big data, which can serve many roles in helping to reduce costs and support patient behavior change.

About two-thirds of our healthcare bill stems from chronic diseases, many of which are related to lifestyle. Life sciences companies could benefit greatly by helping providers to get their patients to change their behaviors. That could be as simple as getting them to adhere to therapy, or it could involve helping them change their lifestyles through exercise, diet, or better sleep.
Data analysis allows us to identify patients at greatest risk. Looking at a combination of EMR data, both structured and unstructured, combined with rich psychosocial data, my team is risk-stratifying patient populations so that resources can go to those patients who would benefit most. Specifically, we are seeking to identify patients on a trajectory for an admission, a readmission, or the progression of a preventable disease. If we can identify the at-risk patients, health plans and providers can intervene early enough to be effective. They can make deliberate levels of investment in support, based upon a patient’s risk for medical events and associated costs.

However, our work goes much further. It is not only to identify patients at risk; it is also to create rich profiles and clusters of patients to support the design and selection of interventions that will work. If you are going to try to change patients’ behavior, you must interact with them in a way that is meaningful to them. After all, if an intervention either does not reach a patient or the patient does not engage with it, the investment is for naught.

To do this, you need to use all the data you can access about that patient and similar patients. You can develop a robust understanding of the individual patient and the others in that group and thereby predict what might help to change that particular patient’s behavior. The provider or life sciences company or health plan can then execute various tactics of support and intervention and can do so when the patient is most receptive and the intervention can do the most good.

Then you assess whether the behavior changed. If it did, you would start using that same tactic, or tactics, on other patients with similar medical profiles, psychosocial profiles, and behavioral profiles. Meanwhile, you would continually gather data during the interventions and support measures. Think of it as continually executing,
assessing who was helped the most and who was not, and refining. How are those patients different from each other, and how are they similar?

Consider how your pharmaceutical company can get into the business of providing support programs to patients directly and take advantage of the frontline provider-patient relationship. Taking it a step further, consider how you can monetize these support programs. How do you charge health plans for those programs, where historically, you might not have wanted to charge, especially in more competitive therapeutic categories.

One of the major challenges is getting more data about the patient; you’ll want to know whether a certain provider has a particular patient who is female, 33 years old, with a particular socioeconomic behavioral profile. There are ways to develop rich data repositories that can be used to set up support and intervention programs, without the life sciences company ever knowing that this is Jane Doe at 234 Locust Lane.

These challenges are significant, though not insurmountable. There are ways of doing this, but they have not been accomplished yet, nor has the full potential been realized.

**OPPORTUNITY: HELP PATIENTS HELP THEMSELVES**

To improve healthcare, one of the things that must take place is increasing engagement between patients and their providers. Let’s say a nurse practitioner sees a diabetic patient on a quarterly basis. The practitioner tells the patient to use a blood glucose monitor four
times a day, and if the blood glucose is not within a defined range, the patient needs to self-inject with insulin.

Today, a patient may or may not do that. When I worked on some diabetes projects in the past and talked with a number of patients with type 2 diabetes, I heard most of them remark, “It is really hard to manage my diabetes exactly as my provider has told me to do it, but I do the very best that I can.” Patients have a variety of devices for managing and checking blood glucose, but those devices do not “talk” to one another. Many of those devices don’t give the patients easy access to their data or to their readings, or a glucose monitor might not store data so it can easily be viewed later. The devices don’t export to an Excel spreadsheet easy, even if they have that capability.

So patients can have great difficulty in collecting their data, and it is nearly impossible for that data to ever make it back to the nurse practitioner who is asking patients to measure their blood glucose four times a day and inject a specific amount of insulin.

What if a pharmaceutical company or a medical device company were to make those devices Bluetooth-connectible so the data would be sent to the cloud? The patient could review the data with the provider during the next office visit. The data would reveal the blood glucose level, how many times a day the patient checked it, and how often the patient injected the insulin. If the patient has an insulin pump, the data would show whether and when the insulin was injected. Maybe the database could be integrated with patients’ iPhones so that they could just snap a picture of a meal before eating it. Some app might convert pictures into a longitudinal graphic of caloric intake.
Imagine if a pharmaceutical company also hired a third party to host a data cloud that could sync with various devices or apps and collect and archive this data. This “cloud” could also include real-time analytics that would continually mine the data both at the individual patient level, specific cohorts, and across large disease populations. The insights from the analytics could then be shared with the patients. For example, a patient could be notified at 2 p.m. on Tuesday of his or her predicted failure to hit a target number of steps that day, based upon information collected about that patient’s activities on previous Tuesdays after 2 p.m. This provides patients with an additional opportunity to plan the rest of their day to avoid getting to the end of the day and realizing they didn’t make their goal.

This forecasting and predicting capability is largely missing in today’s health apps, fitness trackers, and other devices. Information tracked by such devices and apps could also be shared between patients with similar profiles. A patient would be able to give the healthcare provider access to the data residing in this cloud. This sounds similar to what Apple is planning with its HealthKit app. From our discussions with diabetes patients and providers, both parties indicate that having access to longitudinal data could go a long way toward improving glycemic control. Patients and their providers could review the data together to identify particular days or times of the week to strive for improvement.

These are just “what-if” examples. But what if a company were to enter the business of helping a patient collect data and share it with the provider, so they could then work together to better manage the patient’s diabetes? That could be a breakthrough for pharma.

Granted, this is a grand vision that would transform how healthcare is delivered, and devising a successful business model may be
an enormous undertaking. There are, however, a number of possible options for driving revenue. For example, would patients pay the pharmaceutical company a subscription to capture the data and make it accessible to the providers and themselves even though the pharma company might never look at the information because of patient information rights? When a provider requests a patient service, would a health plan provide some level of reimbursement even if the health plan could not see the data?

A legal team may consider this heresy, but it’s an idea that presents a significant opportunity for pharma companies. If Apple’s strategy for the iPhone is to capture your temperature and heart rate and other information off the skin, I wouldn’t be surprised if it developed a sensor on the back of that phone to measure your perspiration for blood chemistry. With Apple already working toward an EPIC EMR integration, these possibilities are not so far-fetched. Additionally, a high percentage of doctors have iPhones and iPads. An app that Apple is running could show a doctor a patient’s data over a secure connection. This would serve as Apple’s entry into delivering content to providers in offices not equipped with an EPIC EMR.

**OPPORTUNITY: A RICH, 360-DEGREE VIEW OF THE PATIENT**

As the models for healthcare change, the pharma industry can create another indispensable role for itself. After all, pharma companies have some of the richest patient insight data: the patient journey, patient segmentation frameworks, insights from executing patient support programs and the needs, attitudes, and behaviors of patients between doctor visits.
Providers get a 15-minute consultation with their patients. They see them during office visits as they treat them and collect data captured in the EMR. They are able to use that data to assess, diagnose, and prescribe a treatment plan for the patient. That is not an easy undertaking in such a short time.

That view tends to end when the patient leaves the office and returns to being, say, a 42-year-old mother who has three kids at home and her father-in-law now living with the family because his wife has passed away and he’s no longer able to care for himself. She works full-time as an accountant. She’s 27 pounds overweight, and she’s struggling with type 2 diabetes. With her husband also working full-time, they shuttle their kids around in the evenings and at weekends, and unfortunately, they eat a lot of fast food and don’t have much time for exercise.

The physician has just said, “You’re overweight. You have diabetes. You need to exercise more. We are going to put you on Metformin at first, and I want you to exercise three times a week, and I want you to lose 15 pounds. Thank you, and call the office if anything changes.”

Given her busy life, you can imagine how she might have a difficult time suddenly incorporating four hours of exercise into her weekly schedule and cutting out fast food. It’s basically a setup for failure.

But pharma companies have interviewed those diabetic patients and understand the challenges they face outside the doctor’s office. They understand these patients have tried to lose weight when their doctor told them to do so. They understand these patients are frustrated, and as soon as they get their diagnosis, they already feel they’ve given up. They don’t see any light at the end of the tunnel. How are they to
find a way to include exercise in their weekly regimen, change their diet, and get their family to help them?

Pharma companies have seen all of this. They understand it, and they know that just telling a patient at the doctor’s office to “go do this, this, and this” rarely works. I think that, to a certain degree, providers also know that it probably won’t work. They only have 15 minutes to consult, and they are doing the best they can to identify, assess, diagnose, and define a treatment pathway.

Now, suppose the pharma company partnered with providers to: 1) get patient data into the cloud so that only providers could see it at the individual level; 2) enable the joining of EMR data with rich psychosocial data and remotely collected data; and 3) include patient behavioral-based segmentation frameworks that indicated attitudes, needs, and behaviors of patients relative to managing their health.

These very rich patient profiles would enable the providers to understand the patient’s challenges outside the office setting and select specific interventions for specific times during the patient journey, based upon the exact timing of events, such as initial diagnosis, treatment initiation, first script, using the actual EMR data as timing triggers. The timing for these interventions could be further optimized for patient segments based upon prior patients’ behavior in response to the interventions. This capability already exists and is being utilized in other industries.

GSK, as an example, has partnered with providers to assist in creating a more holistic view of the patient within the provider’s setting through technology. Phil Golz, Global Head, Commercial Innovation, GSK, has said,
Over the past five years there has been a considerable leap forward in the volume and quality of health-care-related data generated both by health-care systems and by patients enabled by technology advances in smartphones, machine-to-machine connectivity and high-speed networks, as well as the emergence of social health platforms. GSK is working with partners in multiple geographies and across different disease areas on initiatives to better understand how analysis of this data can be used to provide higher quality of care for patients. For example, in an effort to test how to best improve health-care quality generally and patient outcomes in the US, GSK, and Community Care of North Carolina (CCNC) collaborated to develop a predictive analytics tool, Care Triage™, which uses small data like prescription refill history and hospital admission/discharge data to identify patients at risk for hospitalization due to medication management problems. The purpose of this initiative was not marketing but rather, to help GSK learn about new value-driven care models, while also helping CCNC pilot new population health tools. GSK and CCNC learned that the predictive power of the tool could be achieved from small data sets, which could address existing interoperability challenges.

This could be a step toward creating a more comprehensive view of patients’ data outside the clinical setting by incorporating data captured from activity trackers, apps, and social media, as examples.
OPPORTUNITY: ENGAGING PATIENTS USING A 360-DEGREE VIEW

This “what-if” scenario could be extended even further if a pharma company were to engage in disease management instead of solely drug adherence efforts. Providers today don’t necessarily have the time, nor are they compensated, for ongoing patient management and support outside the office beyond a documented care plan and giving patients the opportunity to talk with their provider.

Pharma companies could be brilliant at this. They know a tremendous amount about patients’ challenges. They’ve created support and intervention programs with marginal success, largely based upon limited data. Historically, one problem with these programs is that they work through open invitation. They conduct direct-to-consumer advertising to motivate patients to raise their hands and identify themselves. The catch here is that the ones who reach out to pharma companies to sign up for programs are the ones who are already very engaged with their health. They probably need the least help. It is the patient with the incredibly hectic schedule, the one who works full-time and has three kids and the father-in-law in the house, who needs the most help. This patient would benefit most if the pharma company and the provider were to align and say, “We are going to figure out a way to provide some support for you to drive substantive change.” But those business models don’t exist today.

This is how I foresee pharma companies using patient information they already have in hand from several sources: the patient journey, patient segmentation frameworks, and their experience in executing patient support and patient intervention programs.

This opens the door for innovation in partnering with provider organizations so that every patient who is diagnosed with, say, type 2
diabetes, is then enrolled into a patient support and intervention program that is specifically tailored to each individual’s needs.

Unfortunately, patient support and intervention programs today are “one-size-fits-all.” If a provider does offer a type 2 diabetes support program, it includes everyone with that condition, whether the patient is 65 or 22 years old or retired with grandchildren or a traveling consultant. Each patient gets the exact same patient support program, untailored to that patient’s specific health situation.

This is a recipe for failure because how you talk to a 65-year-old who is retired and maybe sees the grandkids three times a week needs to be drastically different from how you talk to a 22-year-old who travels four days a week and works long hours.

Pharma doesn’t do one-size-fits-all programs. Pharma, because of the segmentation models that I previously described, understands the concept of developing communication programs and support programs tailored to individual patients. The industry understands that some patients are at higher risk than others of not adhering. Pharma, however, has been less successful at intervening with different levels of resources due to regulatory and legal concerns over treating one patient differently from another.

When taking into account large patient populations, the scale and scope of data involved for these opportunities could be defined as big data. This is especially true if multiple providers’ patients are combined into a single cloud repository. Imagine if providers could see their own patients and anonymous data about other providers’ patients. It would be even more valuable if providers shared the data associated with all of the patient support and intervention programs in the cloud. This would also help the entire healthcare system to
learn faster and more efficiently which interventions work for which patients.

This suggests that pharma needs to step up and find new ways to work with provider organizations. It could mean approaching the FDA to make a ruling or taking the FDA to task to say, in effect, “If you’re not going to step up and make a ruling, you are to blame for preventing us from trying to innovate to help patients and drive down the cost of healthcare.”

If pharma companies don’t collaborate to provide patient support services around their brands, somebody else will, and fast. A public example of pharma entering this arena is Pfizer’s strategic alliance with CliniWorks to develop a population health management platform including patient care capabilities. It will be interesting to see if this is solely a technology play to gain a better understanding of provider and patient interaction or if Pfizer is actively looking to extend a service wrapper around its brands. There have been a refreshing number of partnerships between technology companies, such as MC10, Qualcomm, and Google X, and pharma companies to address both disease management opportunities and remote patient monitoring. The industry needs to increase the technology partnerships to further drive innovation in capturing patient data, analyzing the data, and translating the resulting insights into actions that support patient’s behavior change.

I think it will be providers who will take the lead in finding partners to build support for patients. If pharma doesn’t solicit providers and health plans to develop partnerships to better support patients and promote education, providers will look elsewhere for that help. Pharma companies need to take a seat at the head of the table.
An increasing number of vendors are working to fill this role today. Google has added it to its strategic plan, and Apple has it in its Operating System 8. I think both of these companies already have the mindset that they are going to have a role in healthcare, and I see that role as one of helping patients help themselves. Part and parcel with that is helping patients capture data about how they are managing their health and their diseases.

If pharma companies wanted to change their commercial models, and if they could, now is the time. If they don’t enter the market soon, it may be too late. A company such as Samsung could compete against Apple and have a good shot at penetrating the market. However, I can’t see a pharma company competing with Apple. I see innovation and a new commercial model at the core of Apple. Could a pharma company compete with an established Apple in the healthcare market? Probably not. Could it get in there before Apple gets there and figures it out? I think so. Pharma companies already know more about patients. They have more information capital on healthcare overall. I think they have a shot and can make it successful.

**PRIVACY IS RELATIVE**

In my opinion, privacy won’t be a significant issue in this age of big data so long as we continue to use the information responsibly to help patients. People are concerned, and rightfully so, that somebody may steal their identity and access their bank accounts or hack through corporate firewalls to get their credit card numbers. But in general, to date, there hasn’t been widespread concern about socioeconomic behavioral data being used by healthcare providers to identify what
treatments would work best or which patient support and intervention programs should be recommended.

It appears that younger generations have less concern about their data privacy on the Internet and what they choose to make available. Older generations lean toward being more concerned and prudent about privacy and data. But if data is used to successfully help patients have better outcomes, perhaps the public won’t mind that the data was obtained from Facebook or Twitter. If you can deliver a significant value, and it’s recognized you used the data responsibly, people likely will be comfortable with it.

One of the biggest risks for healthcare’s reputation in using data stems from public perception of patient privacy breaches of EMR data. One of my biggest concerns is that these cases will arouse public suspicion to cause a knee-jerk reaction demanding that EMR data not be shared with anyone outside the specific provider or payer entity that collected it. Such a public reaction could deprive us of a great opportunity for good, through richer insights into patients. Partners and potential partners of providers would no longer be able to share data with providers. Providers and those who support them could be irresponsible, triggering such a reaction. Therefore, it is essential that all healthcare entities that manage or access data today must secure and use it responsibly and protect it from release.

Personal health information constitutes an immense amount of the most private information about a person. It must be treated with dignity and in compliance with privacy laws. As we look to put health data to commercial use, we must remember that the primary mission is to help others. When that value is demonstrated, the population may be less likely to push back.
WHERE THERE’S A WILL, THERE’S A WAY

How do we inaugurate a new era of pharma marketing in a time when US baby boomers are aging and their health problems are compounding?

It really comes back to embracing innovation and being prepared to change the historic commercial model to explore new ways to support patient behavior change. That may come in the form of supporting patients directly, enabling patients and providers to have a better exchange of information and data, and of course, helping providers help their patients change their behavior.

As the bulk of the US population ages and healthcare issues and costs abound, we need to take action. If as a society, we are spending money on healthcare, by definition we are not spending money on education. We are not spending money on social programs. We are not spending money on infrastructure. We are not spending money on our military. We are not spending money on new natural resource development or our energy sources. By spending so much money on healthcare, both directly and indirectly, we are limiting our ability to spend elsewhere.

Nevertheless, for a time we will need to overinvest in healthcare to move to a more preventive care model so we can avoid some of the high-cost, chronic-disease situations we find ourselves in today. Obesity has been shown to lead to type 2 diabetes. If we can stop the lion’s share of patients’ weight gain by supporting weight loss through exercise and diet early on, we may avoid many critical care events and the ongoing chronic management and costs of type 2 diabetes.
In other words, if we were to spend a little more on the front end, we may save much more on the back end. I think that is a huge opportunity for the US, as a nation, and why healthcare reform is structured as it is. Preventive care is being covered, and it most certainly should be covered. It’s penny-wise to spend less money on patients before their problems worsen and cost exponentially more to individuals, to the healthcare ecosystem, and to society.

The era of big data can have a significant and enduring impact on our ability to care for ourselves, as a society. The pharma industry, if it keeps up with the times, has the capacity to play a central role in designing the future of healthcare. The question is whether it has the will.

**MOVING TO THE FRONT OF THE PACK**

Recently, I was at an excellent conference hosted by the Johns Hopkins Center for Population Health Information Technology. It was attended by tremendous thought leaders, executives from large provider organizations, payer organizations, government think tanks, and government representatives.

One of the presenters referred to the book *The American Healthcare Paradox: Why Spending More Is Getting Us Less* by Elizabeth H. Bradley, Lauren A. Taylor, and Harvey V. Fineberg. The authors mention the familiar chart that shows life expectancies around the world and how much each nation spends per capita on healthcare.

This has always bothered me. The US spends so much more than other countries, yet our life expectancy is only about middle of the
pack. In fact, one developing nation has a life expectancy closely aligned with the US, yet it spends nearly nothing on healthcare.

By rerunning the analysis, the authors basically exposed what that chart does not show and what it should show. They said we need to look at social service spending plus healthcare spending and then assess life expectancy.

A lot of other countries spend a lot more money on social services, essentially making sure that things such as “food deserts” don’t exist, making sure that communities have much more green space, and including ways in which people can exercise. These lifestyle attributes are built into the society as cultural fiber, making it easier for people to achieve more exercise, have better diets, and utilize social services that improve quality of life.

When you add social services spending to the healthcare spending and compare other nations to the US, the picture becomes clear: we are right in the middle of the pack on how much we spend per capita for both combined. Factoring in social services elevates the rate of life expectancy, or the ROI. In other words, it pays to prevent.

This emphasizes the importance of spending more prevention dollars up front to save healthcare costs down the road. You can help prevent obesity, thus lessening the type 2 diabetes epidemic, and subsequently, avoid the tremendous costs of strokes, amputations, blindness, and the many other complications of the disease. We could avoid all that if we were to spend money up front to help people lose weight and exercise more and have a better diet.

As we redesign healthcare, and in part, accomplish this by supporting patients’ sustained behavior change, we will inevitably invest in patient support and interventions that are not effective for every
patient. Overinvestment will exist, for a time, as we learn what drives behavior change at the individual patient level and become more efficient in allocating future resources to support the behavior change of other patients. This is the massive and critical opportunity for the healthcare and pharmaceutical industry, in which big data has a central role.

It is big data that is allowing us to gain better insights into what really works. The data is rich enough, and as we collect more of it, the dividends can be immense.