Health providers need to see patients as individuals and health consumers rather than disease states. It will be just as important to focus on influencing their beliefs and behaviors as on treating physiological processes.
This publication is part of a series looking at the future of the healthcare industry. To read or download other papers in the series, please visit www.atkearney.com/health.
In theory, healthcare should be a great industry to be in. It is almost guaranteed to grow, as demographics and rising consumer expectations drive demand. It is also a hotbed of science and innovation, with pharmaceutical companies alone spending more on R&D as a proportion of sales than businesses in any other industry. The industry’s growth rates and margins elicit envy, while leading consumer goods and technology companies view consumer-driven healthcare as a major source of future revenue. Surprisingly, though, virtually every part of the healthcare ecosystem is struggling.

Something much more fundamental is going on: healthcare's business model has become obsolete.

Among players in the healthcare sector, the pharmaceutical industry alone shed nearly 300,000 people worldwide between 2000 and early 2011 as a result of pricing pressures, cost reduction, and unproductive research. Moreover, although fuller pipelines offer some light at the end of the tunnel, it is still far from clear that additional funds will be made available to pay for new technologies. Even emerging markets are proving more challenging and less profitable than previously hoped.

The usual explanation for this turmoil is a perfect storm of increasing demand, a stubborn lack of progress in improving productivity, and a world that has run out of money. While all of this is true, we believe there is something far more fundamental going on: healthcare’s business model has become obsolete. The types of therapies, industry structures, relationships, and assumptions underpinning the industry were formed in an age that is rapidly disappearing, reshaped by technology and societal changes (see sidebar: How Technology and Society Shape Business Models on page 3). If organizations wish to get back to growth, they need to adapt their business models to the new reality.

It is time for a new view of medicine and a new way of doing business.

The Three Ages of Modern Medicine

Modern medicine, born during the second Industrial Revolution of the late 19th century, is now in its third distinctive age (see figure 1 on page 2). Throughout these three ages, technology and innovation have led the pharmaceutical industry down a nearly century-long path of success, but like all business models, pharma must adapt to the same changes that it helps to produce. As we will see, three main factors drive the healthcare industry’s business model at any given time: the healthcare challenges society is facing, the technologies available to address those challenges, and the broader industrial and social context.

In the first age of modern medicine, scientific medicine emerged, as germ theory paved the way for the discovery of the biological basis of infectious disease. Surgery became feasible for conditions other than amputation, anesthetics and diagnostic technologies were discovered, and journals began to thrive.

1. 2013 EU Industrial R&D Investment Scoreboard, the European Commission’s Joint Research Centre Institute for Prospective Technological Studies and Directorate-General for Research and Innovation, Luxembourg: Publications Office of the European Union

2. Challenger, Gray & Christmas, as cited in “A Decade in Drug Industry Layoffs” by Matthew Herper, Forbes, 13 April 2011
and science-based pharmaceuticals came to market. Add to this formulation the ingredients of cheap distribution and free trade arrangements, and you have the basis for a global healthcare industry, albeit a freewheeling one with few constraints. In this short period from 1870 to 1949, the industry evolved from a cottage industry of apothecaries and barber surgeons to a mass production industry producing 133 billion doses of penicillin a year in the United States alone. It was in this environment that all the major drug companies of today were born.

The second age of modern medicine, a golden age of pharmaceutical innovation, began in the 1960s with the regulation of pharmaceuticals in response to the thalidomide disaster and a shift in Western attention from infectious disease (now largely conquered) to cardiovascular disease and cancer. New medicines, technologies, and therapies—including statins, pacemakers, radiation therapy, and antineoplastic drugs—were developed to fight these serious ailments. It was a time of fabulous profits for the healthcare industry, and the pharmaceutical industry posted annual growth rates between 8 and 15 percent. As Peter Drucker said, “Business has only two functions: marketing and innovation. All the rest are costs.” And pharma companies didn’t care much about costs. By 2000, the market capitalization of the top 10 pharma companies had grown to more than $1.6 trillion. However, as we eventually discovered, 2000 was the peak of the curve.

Today, we are squarely in the third age of modern medicine, when the affordability and value of treatments have come to the forefront. Wealth and longevity have led to an explosion of chronic disease, and although science has managed to prolong life, it has been unable to prevent mental decline. Health systems designed to treat acute disease are struggling to cope with these new issues, while at the same time, expensive health technologies have driven healthcare spending...
to anywhere from around 10 percent of GDP in most developed countries to 17 percent in the United States. As a result, health is now seen as a cost problem, and virtually every Western country is now forecasting a decline in health spending as a proportion of GDP, even as the load on the health system increases.

So although the pharmaceutical industry is rightly upbeat about many of the innovative medicines coming through in areas such as cancer and hepatitis C, the sad fact is that this will not lead to growth if there is no money to pay for them. Long-term prosperity can only come from tackling the most pressing health problems facing the world and exploiting the changing technological and social landscape to create far greater value.

To put it bluntly, many of today’s healthcare business models are broken and must be reconfigured to meet the needs of the new age.

New Dynamics, New Technologies for a New Age

Against a backdrop of widespread chronic disease and waning resources, new dynamics are emerging and new technologies are becoming more important. The growth of chronic disease has been largely driven by the behavior and lifestyle choices of an increasingly affluent world. The only way to control the growth is to modify these behaviors. Treatments in the third age will need to become much more holistic and seek to actively involve patients in their own treatment. Interventions will consist of a combination of pharmaceutical, behavioral, nutritional, and digital technologies.

For example, the growth of type 2 diabetes is probably the single biggest health challenge in both developed and emerging markets. Pharmaceuticals are able to control the disease but not

How Technology and Society Shape Business Models

Technology doesn’t just change the way we do business; it changes the very world in which we live and operate. During the first Industrial Revolution, steam power, machine tools, and mass transport produced new industries of mass production: textiles, iron, and crucially for the pharmaceutical industry, base chemicals and dyestuffs. As a result, the predominant business model shifted from a feudal, localized agricultural society to urban, organized capitalism. This in turn led to the emergence of a middle class and the rise of organized labor. During the second Industrial Revolution, science-based developments such as electricity and the combustion engine accelerated industrial development and produced many of today’s modern industries, including what would become the modern pharmaceutical industry. Today, we are entering a similar period of radical, technology-driven change—a third Industrial Revolution. Only this time, information will provide the impetus for change.

We now create as much information every two days as we did from the dawn of civilization up until 2003, according to Google CEO Eric Schmidt. Much of that information is available instantaneously to anyone with a moderately powerful mobile phone, tablet, or computer—around 40 percent of the world’s population today. Technology has empowered individuals to an unprecedented extent and democratized information as a source of power. Companies, products, people, and even governments can be created and destroyed by popular acclaim. At the moment, the true impact of this revolution is unclear. It took nearly a century for the full impact of steam to become evident. But what we do know is that these revolutionary changes are having a direct effect on healthcare and the nature of medicine. To survive and thrive, we must understand and adapt to these changes sooner rather than later and work to produce a new medical business model.
cure it, and most type 2 diabetics progress through the disease to an early death. However, work such as that being done at the Human Nutrition Research Centre at Newcastle University suggests it might be possible to reverse diabetes using fasting to remove fat from the liver, accompanied by exercise and nutrition to build muscle. If such treatments are to become mainstream, however, breakthroughs are needed in our ability to persuade people with sedentary habits and carbohydrate-rich diets to swap TV dinners for trips to the gym. It will also require counseling to prepare patients for treatment, technology to monitor and encourage reduced caloric intake, specialized nutrition to accelerate muscle building, and even appetite suppressors to help patients stay the course.

Emerging research suggests the same mechanisms that trigger diabetes may also increase the risk of Alzheimer’s. So although traditional pharmaceuticals have notably failed to have an impact on the disease, moderate exercise, dietary control, and social interaction may markedly reduce its incidence.

In the third age, much of healthcare will continue to be delivered through the familiar technologies of pharmaceuticals and surgical intervention. However, a far broader view of medical innovation will be required—one that encompasses new technologies based on fields of science that are barely understood or not widely accepted as part of the medical paradigm.

Exercise and food: The new wonder drugs

In the same way that penicillin revolutionized the first age of medicine and statins the second age, it looks as though exercise will be the wonder drug of the third age. As outlined in the excellent video by Dr. Mike Evans, “23 and ½ Hours,” 20 minutes of walking a day has been shown to reduce high blood pressure by 29 percent, while one hour of exercise a week has been shown to cut heart disease by half. Exercise has also been proved to be far more effective than surgical stents at preventing events for those with blocked arteries and can reduce arthritis and prevent the progression of dementia. What’s more, all of this is free.

Nutrition is another emerging healthcare technology. Despite sometimes confusing or contradictory evidence, it does seem that nutrition has a huge impact on the development of a wide range of diseases. As Professor Robert Lustig of the University of California discusses, evidence is building that sugar has a particularly devastating impact on both cardiovascular and metabolic health. In fact, sugar may one day be regarded as a public health issue on a par with tobacco and alcohol.

On the curative side of nutrition, data is beginning to support the pharmacological benefits of specific foods, often referred to as nutraceuticals. Moving forward, scientifically developed combinations of nutrients will be increasingly used to improve the efficacy of other treatments, or even as primary therapeutic interventions. For example, early evidence suggests that a medical food known as Souvenaid from Nutricia might prevent or even reverse the progression

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5 Mike Evans, “23 and ½ Hours,” Evans Health Lab video, 9:19, 2 December 2011


of Alzheimer’s disease, a feat complex drug therapies have failed to achieve. Tailored nutrients have also been shown to improve a person’s tolerance to chemotherapy, though they are rarely administered in practice. Nutritional solutions can even reduce the frequency of bedsores, a major cause of excess hospital stays.

**Powering up the body’s defenses**

Science is just beginning to understand the body’s ability to heal itself. As placebo trials have shown, the brain is more capable of controlling pain and metabolic processes than we are currently able to exploit. This likely explains the continued popularity of alternative medicines such as homeopathy, which have no scientific basis.

**Neuroplasticity**, or the ability of the brain to rewire itself, offers huge potential for addressing health issues such as attention deficit hyperactivity disorder (ADHD), dyslexia, and Down syndrome. In the longer term, it may even lead to breakthroughs in treating depression, anorexia, and other behavioral and emotional disorders. Given that we now know that neuron formation continues well into old age, even neurodegenerative diseases might one day be managed through brain exercise.

Of course, pharmaceuticals will remain the most prevalent and powerful technology to address disease, but even here, the theme of helping the body heal itself continues. The most exciting and startling innovations in cancer treatment are currently focused on **immunotherapies** that either “reveal” cancers to the immune system or reengineer the immune system to recognize malignancy. This is far subtler than the blunt instrument of traditional chemotherapy.

The theme of working with the body to cure disease will no doubt expand to other health challenges too. As the cost of gene sequencing continues to plummet, **regenerative and other genetic treatments** offer the opportunity to both extend life and restore function to the seriously injured (see figure 2).

Yet all of this can only do so much without active patient participation.

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**Figure 2**

**The cost of gene sequencing continues to drop**

**Cost of gene sequencing**

($, logarithmic scale)

- **September 2001**: Cost of sequencing a single human genome was close to $1,000 million.
- **September 2012**: Life Technologies unveils “Ion Proton™ System” that can sequence the human genome for $1,000 in a few hours.

Sources: DNA Sequencing Costs, National Human Genome Research Institute (U.S. National Institutes of Health), accessed on 22 June 2014; A.T. Kearney analysis
Behavioral change as a scientific discipline

Behavioral patterns are the single largest determinant of premature death in the developed world (see figure 3). Because behavior is at the root of so many health problems, the ability to modify it must become a core therapeutic intervention. Compared to the sophistication of pharmacology, however, behavioral science is in its infancy.

Figure 3
Determinants of health and their contribution to premature death

Many of today’s approaches are too institution-centric to make a difference. Education and “expert patient” programs are effective for those who participate but don’t work for those who most need help. “Intelligent co-pays” that reduce deductibles for good behavior can be effective, but it is really just bribing people to behave; it does not cause people to engage with their own health states. Collaborative decision making as practiced by companies such as Health Dialog can help patients make informed choices, but it is too expensive to be made widely available in its current form.

Future solutions are likely to build on insights from both consumer marketing and addiction treatment programs, both of which seek to build emotionally relevant connections between behavioral changes and the goals and aspirations of the individual. Neuromarketing is an emerging field that seeks to understand how marketing techniques impact brain function. While perhaps rather sinister in the context of consumer advertising, it could be a powerful way to develop health interventions that encourage healthy behavior.

The importance of behavior also changes the meaning of personalized medicine, which until now has been framed as tailoring molecules to the genetic nature of the individual or disease. However, behavioral issues such as compliance with therapy are a function of the person not the disease, so personalization will need to encompass the culture and character of the individual to be successful.
The consumerization and digitization of health

In today’s information age, healthcare’s business environment will inevitably be shaped by new consumer-based technologies, insights from big data, and the societal changes wrought by digital media.

Today, labs-on-a-chip can detect diseases by smell, sweat, or pinprick blood samples, and portable ultrasound units are fast replacing the stethoscope as the doctor’s general diagnostic tool of choice. Algorithms are even being developed that use biometric, demographic, and clinical data to predict problems—including life-threatening events such as heart attacks and strokes—before patients develop symptoms.

Despite all this, though, the biggest change is the use of consumer-based technology to replace expensive medical technologies with cheap patient-oriented devices. Hubs for remote monitoring used to be pieces of dedicated hardware costing thousands of dollars. Now a smartphone can do the same job, but with much nicer graphics and a built-in voice and video interface. A sophisticated health monitoring system costing thousands a few years ago can be assembled for a fraction of the price using biometric sensors bought on Amazon. The latest iPhone has a motion-sensing chip specifically designed for health and fitness applications, and both Apple and Samsung have signaled their intention to become major players in health technology.

Health solutions will create emotional connections between behavioral change and personal goals and aspirations.

This consumerization of health is also being driven by the availability of plentiful and free medical information, which means patients often know as much or more about a disease than their doctors. Social networks help patients and caregivers seek advice from their peers in addition, or sometimes in preference, to professionals. In 2008, 59 percent of patients in the United States were regularly using the Internet to investigate health issues and 34 percent were using social media.8 Exploiting these new channels offers the potential to connect with health consumers in a way that health systems have remarkably failed to do so far.

Another consequence of the digitization of communication is that it generates a tsunami of big data that, while potentially powerful, is also difficult to interpret. The ability to capture and manipulate large data sets will change the nature of evidence, allowing retrospective analysis of circumstances in which different therapeutic approaches work. This in turn will support rapid experimentation and testing in the real world, which are crucial to developing effective approaches to behavioral change and experimenting with systematic models of care delivery.

So far, the ability to exploit these technologies resides not with the healthcare companies but rather with those that truly understand consumer behavior. Amazon tailors customers’ every interaction based on their history, and Google merges data sets to define an individual’s behavior with startling accuracy. More importantly, these companies understand that the future is not about competing products, but competing, seamlessly integrated ecosystems.

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8 Noah Elkin, How America Searches: Health and Wellness, iCrossing, January 2008
But perhaps the biggest shock for pharma companies working in this space will be the speed of innovation. When one considers that the modern mobile and social media infrastructure of Facebook, Twitter, YouTube, and app stores only dates back some six to eight years, innovation cycles within healthcare seem glacial by comparison. For example, the life cycle of a single medical technology—statins—is essentially the same as that of the entire mobile phone industry.

Of course, consumerization and digitization do not spell the end of specialist medical technologies, especially for implantable devices, and there will always be a need for complex and expensive diagnostic and radiological technologies. However, for chronic and preventable diseases, which represent the majority of tomorrow’s healthcare challenges, the likely winners are mass market consumer companies, Internet providers, and even supermarkets—in other words, companies that know how to provide flawlessly integrated services that consumers can relate to (see sidebar: Supermarkets Get Into Diabetes Management).

Prospering in the Third Age of Medicine

At the core of the third age will be engaging patients as active participants in managing their own health. To do this, health providers must stop looking at patients as disease states and instead see them as individuals and health consumers. As much effort needs to be focused on influencing their beliefs and behaviors as on treating physiological processes. Health systems, despite being notoriously conservative and slow, will eventually adapt to the new dynamics of the third age (see sidebar: Preparing for the Third Age on page 9).

In the emerging atomized, fluid, omnichannel, information-rich, networked world, health systems built around large hospitals that still use paper and fax machines look like relics from an earlier age. While the educated and well-off may be prepared to travel and wait to see their doctor, many of those in greatest need will remain alienated. Healthcare professionals will have to reach out and communicate with patients using newer, more user-friendly channels. Interactions in healthcare, as in many other industries, will increasingly be conducted using digital technologies.

Empowering, informing, and demanding that people make choices will be a large part of this shift. There is already a trend in social care of giving people allowances to spend as they like rather than forcing them to use services they might find irrelevant or inappropriate, and this is likely to grow. Reimbursement systems will need to move from fee-for-service to more capitated and outcome-based models to encourage preventive medicine. The nature of scientific evidence will need to move decisively into the real world, away from the simplistic question of “does it work” to “under what circumstances and for what types of people does it work.” Regulation will need to be overhauled to support new forms of evidence, to recognize the importance of nutrition and new technologies, and to support more mature communications between healthcare companies and those who consume their products.

Supermarkets Get Into Diabetes Management

Tesco, a leading UK supermarket, partnered with Diabetes UK to create a special Diabetes Support Diet Plan as part of its TescoDiets service. For less than $3 a week, diabetics who sign up for the plan can select customizable diets, which can be converted automatically into shopping lists and delivered to the home. In addition, each person is assigned a “diet mentor” to provide feedback and granted access to a social media community.
The likely winners in the treatment of chronic and preventable diseases are companies that know how to provide flawlessly integrated services to which customers can relate.

In this environment, pharmaceutical companies will need to decide where they want to play. As complementary therapies become more important than primary intervention, pharma companies will need to decide if they wish to provide the health solution itself or just molecular components of it. At the most basic level, pharma companies will need to deploy smart delivery systems to increase compliance. Recent breakthroughs in automotive performance owe as much to electronics as to mechanical engineering, and the same is likely to be true of medicines. For example, poor adherence in respiratory disease costs a typical healthcare system hundreds of millions of dollars each year in unplanned hospital admissions. Intelligent respirators that address this problem will add much greater value than minor improvements in efficacy of the molecule.

Preparing for the Third Age

While many of the topics discussed in this paper may seem far off and visionary, Bill Gates once said, “We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next 10. Don’t let yourself be lulled into inaction.”

We believe there are practical actions to take today to prepare for this forthcoming change, impacting every area of business:

- **Clarify the strategy of the organization** as a component supplier or solutions integrator, and get owners and stakeholders to buy into that vision and commit to it. Look outside the boundaries of your industry to see who your new competitors will be.

- **Broaden the focus of research and product development** to encompass complementary technologies such as diagnostics, nutrition, behavioral change, and wearable and implantable digital technologies. Make strategic investments and form partnerships with leading innovators in novel technologies.

- **Build the evidence** for the effectiveness of combinations of technologies in the real world. Influence the regulatory system to value systemic interventions.

- **Rethink your channels** as a services and solutions provider to get closer to customers and consumers.

- **Reimagine the customer engagement model.** Understand who your customers will be, and align your resources around them. Embrace social media and other new channels, and learn how to make them work for you. Use big data to understand how and why consumers behave the way they do, as well as how to prove health outcomes in the real world.
If pharma companies wish to capture the real value of the new medicine, they will need to learn from companies such as Google and Apple that in a digital world, integration and seamless customer experience are primary sources of value. Forward-thinking players will evolve to become integrators and orchestrators, as comfortable in the world of services, digital technologies, and behavioral change as biochemistry. They will learn to move fast—at the speed of the digital age.

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