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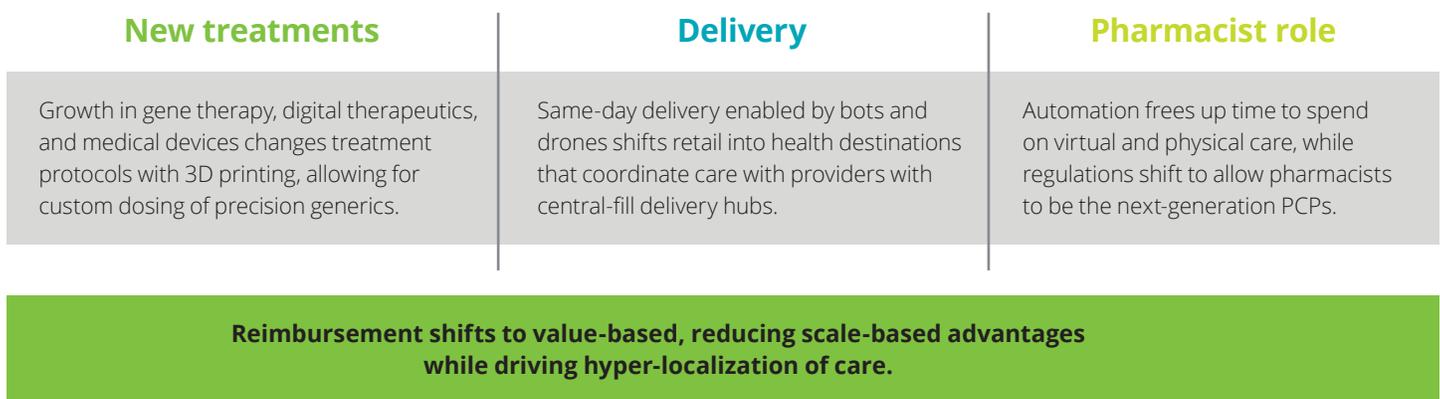
The future of pharmacy

Disruption creates transformative opportunities and challenges

Introduction

Exponential change is accelerating disruption across the health care value chain and transforming the future of pharmacy. Clinical and technology breakthroughs are occurring at a record pace, building on the power of artificial intelligence (AI), robotics, and insights derived from radically interoperable data, as outlined in Deloitte’s Future of Health research.¹ This should allow us to shift from “imprecision medicine”² to precision treatments, but it will likely change the role of the pharmacist and the delivery channels we know today. This combination may finally allow us to cross the chasm from a fee-for-service reimbursement model to a value-based model (figure 1), aligning pharmacy with the broader payer shifts underway.

Figure 1. Potential disruptions to the pharmacy supply chain



While the pace and rate of adoption are debatable, amazing innovation is already happening.

- Researchers are developing **smart mirrors** that use advanced cameras and your breath to detect health variations³ and have been working on smart toilets⁴ for years.
- Multiple companies are testing and working on **home health care bots** that can perform basic services, while elderly workers in Japan are already using **exoskeletons** to extend their ability to perform manual labor.⁵
- Smartphones are evolving to allow them to act as point-of-care and **home health diagnostic tools** for conditions such as urinary tract infections⁶ or diabetic eye disease.⁷
- Labs have produced an **ingestible origami robot** that can be swallowed and controlled to, for example, patch a wound⁸ and are testing xenobots, programmable organisms developed from frog stem cells, that could deliver medicine.⁹

- Companies are using the gut microbiome to create a **food-as-medicine** approach to manage glucose levels and improve overall health.¹⁰

When you combine the impacts of these and similar innovations with the growing influence of empowered consumers who are focused on their well-being and demanding convenience, access, and customized health care products, the future of what we consider pharmacy today will likely be radically different. In this potential future state, AI and machine learning will create new insights linked to massive, interoperable data sets that include pharmacy, medical, lab, demographic, social, mental, and environmental data. At the same time, robotics and automation will change how prescriptions are filled and delivered, pushing the pharmacist to take on new roles or risk being disintermediated. These dynamics create exciting tension for pharmacy companies and pharmacists, as they debate how to win in today’s market while planning, adapting, and investing for the future.

Disruption happens fast

Many pharmacies operate on a legacy business model, which is only just beginning to embrace the technologies and customer service innovation that other industries adopted years ago. For example, today's retail pharmacists are highly trained and trusted medical professionals who spend a disproportionate amount of time counting pills and addressing clinical edits rather than operating at the top of their license (for example, point-of-care testing and counseling). Not only does this minimize their ability to affect patient outcomes, it is causing safety¹¹ and profitability¹² issues, as recently discussed in several articles. To complicate matters, regulators and nontraditional players empowered by billions of dollars in venture funding¹³ are challenging the legacy profit pools across the entire supply chain, affecting pharmaceutical manufacturers, distributors, pharmacy benefit managers (PBMs), and pharmacies.

This might lead you to believe that gradual evolution will improve the market, but the dynamic pace of today's innovation cycles is more likely to create disruption, not simple change. Looking ahead, we can begin to imagine a very different pharmacy industry in which:

- Treatments would no longer be focused on chemical and biologic solutions but instead focus on digital therapeutics, nutraceuticals, implants, gene editing,¹⁴ and programmable bacteria accelerated by clinical research in areas such as epigenetics, neuroplasticity, and bioelectric medicine.

- Retail pharmacies could shift from convenience-store models to become consolidated health destinations with product distribution altered by 3D printing, kiosks, telehealth, and same-day delivery by driverless cars, autonomous bots, and drones.
- Automation and AI algorithms would enhance pharmacists' responsibilities, allowing them to operate at the top of their license and become recognized as care providers (enabled by legislation), ultimately prescribing acute medications and managing chronic diseases.
- Accessible genomic data may make mass-customized generics (such as precision dosing), precision specialty medications, and highly personalized care plans readily available to the market.¹⁵
- Massive data sets connected by Internet of Things (IoT) connected devices, cloud-based algorithms, and quantum computing

could enable real-time diagnosis and insights that are integrated into our daily lives and shared across care providers.

- Reimbursement and health coverage could evolve so that genetic conditions may be covered by a safety-net funding mechanism, while payers focus on motivating consumers to make healthier decisions while supporting them in addressing social determinants of health¹⁶ (such as housing, food, and loneliness).

While many of these changes seem inevitable, the key question is: How quickly will they occur? While the regulatory environment is a key variable, the time horizon also depends upon consumer adoption of technology, where and how competitors invest, and the economic viability of the innovations that are brought to market (figure 2).

Figure 2. Several variables affect the rate of change



“We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don't let yourself be lulled into inaction.”

—Bill Gates, *The Road Ahead* (Penguin Books, New York, 1996)

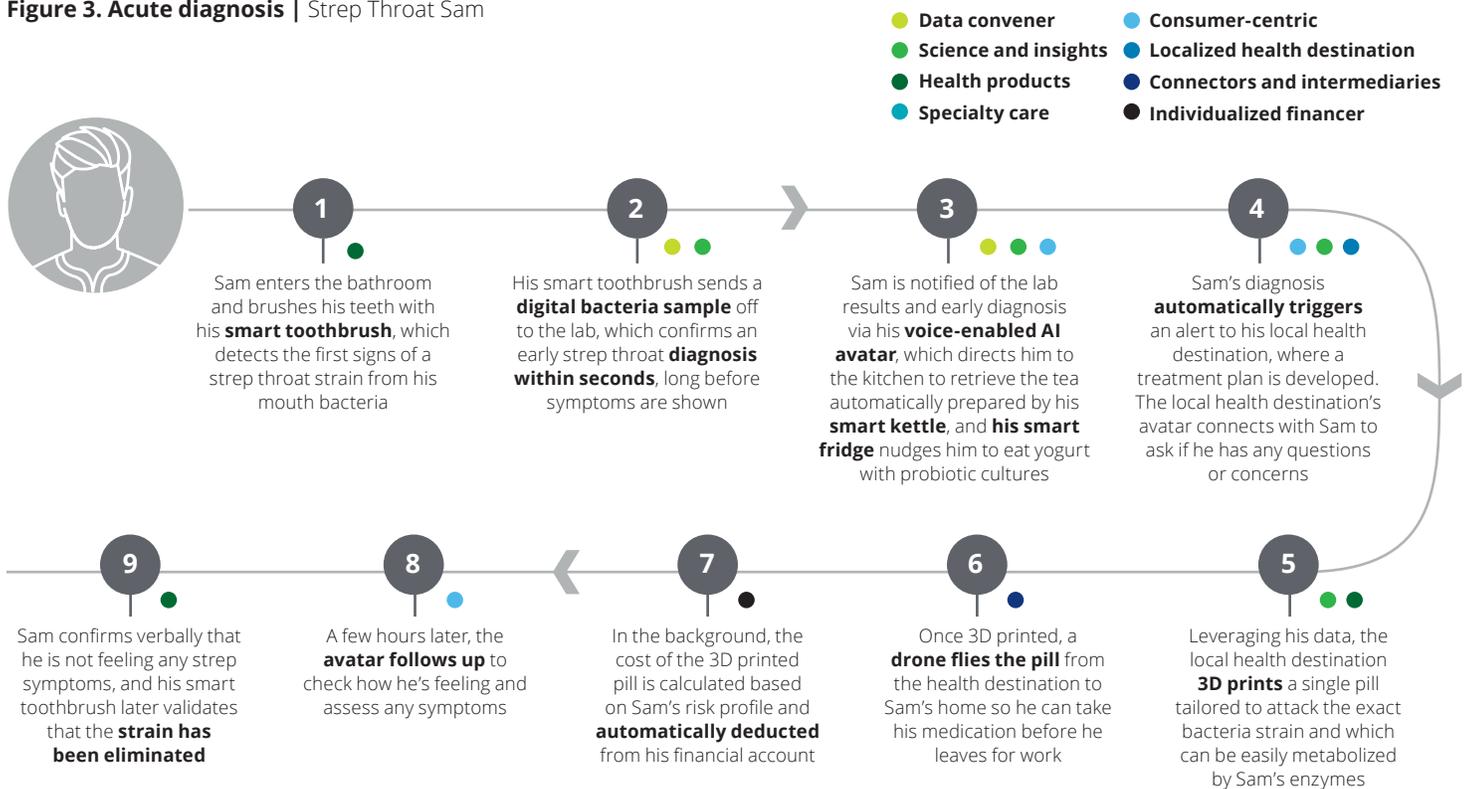
The future consumer experience

To really understand our vision of the future of pharmacy, it is important to begin with the consumer and think about how their health care journey changes. As technology becomes ubiquitous and integrated into the smart home, the role of the pharmacy and pharmacist evolves into one that may not even be recognized by today's standards. We see a convergence of health and wellness, along with an expanded role of telehealth and virtual health care. And while the traditional retail pharmacy experience may no longer exist, there still is likely to be a role for coordinated and high-touch

care delivered locally—we see competition between health care professionals for these roles (RPhs, RNs, NPs, PAs, and MDs). There also likely will be people that are not compliant or not willing or able to take advantage of digital health technology (even as costs drop dramatically) and need in-person care.

To help illustrate how this future state could be experienced, here's a customer journey for Strep Throat Sam (figure 3):

Figure 3. Acute diagnosis | Strep Throat Sam



Note: This represents a hypothetical future journey.

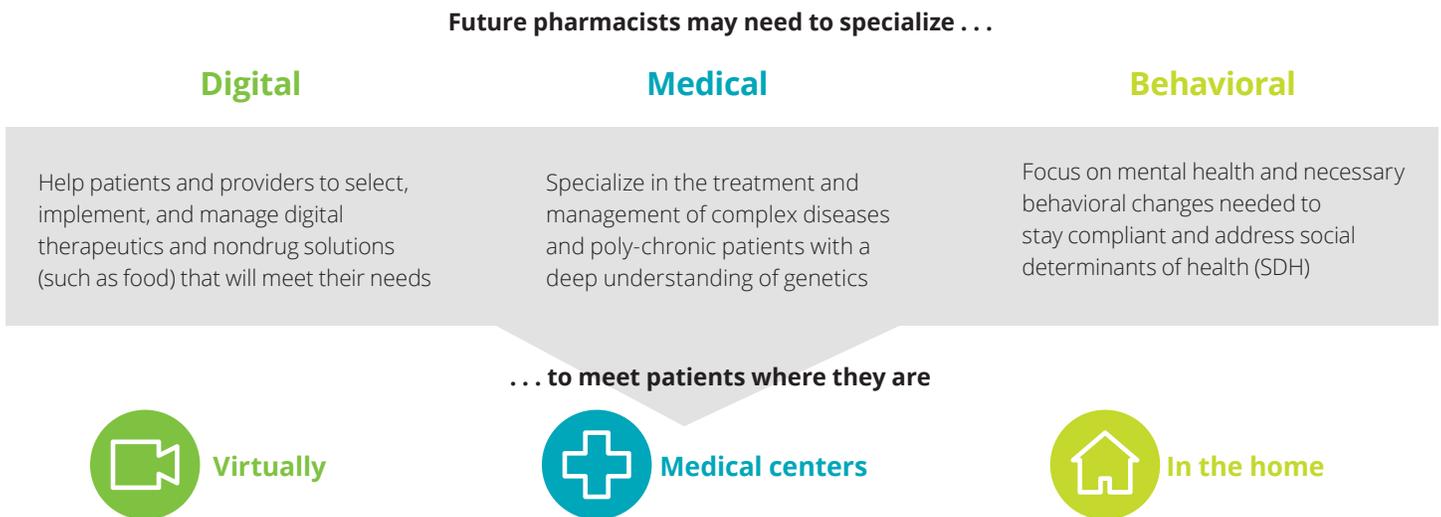
Future of the pharmacist

In today's health care ecosystem, the pharmacist is a trusted, critical, and—often—underutilized resource. As the pharmacy industry increases its use of enabling technologies, pharmacists may find themselves at a professional crossroads: either grow their role's scope and value or face potential disintermediation. After all, in a not-so-distant future, robots will likely dispense medication to patients, 3D printers may print combination therapies, and algorithms may address most clinical edits. When combined with technology like smart contact lenses that use augmented reality (AR), it's possible that lower-skilled staff such as pharmacy technicians may be able to conduct basic tasks like visual verification.

For many pharmacists, this is a welcome opportunity to practice at the top of their license, focusing on being part of the health care team through disease state education, counseling on medications, vaccinations, providing chronic care management alongside physicians, and other cognitive services.

Fortunately, an increasing demand for physicians,¹⁷ combined with projections about people living longer, should create opportunities for pharmacists to evolve and expand their role—perhaps even to become the next generation of primary care providers (PCPs) who treat patients with acute illnesses and manage chronic conditions like diabetes, hypertension, and asthma. That will require regulatory changes, but pharmacists are increasingly being recognized as providers in the United States,¹⁸ building on global discussions about pharmacist prescribing.¹⁹ We see three specialized paths going forward: digital, medical, and behavioral (figure 4):

Figure 4. Pharmacists' evolving role



Moving forward

To move confidently into the future of pharmacy, companies should begin by acknowledging and being realistic about their core competencies and how those are sustainable and/or transferable. While there are clearly opportunities to continue to make money today, forward-thinking organizations are asking questions such as:

- Who inside or outside of our ecosystem will be a competitor or disruptor? Who could be an ally?
- How quickly will our sector innovate relative to the ecosystem's rate of change?
- How will risk shift to or away from us, and what will that affect?
- Should we innovate now to be in control of our future or wait until the disruptors gain market share and prove the model, in which case it's much more expensive to get into the market?
- How will our talent strategy and organizational structure support our future business?
- Do our existing systems and technology support expectations for omnichannel and digital or virtual engagement?

Ultimately, the challenge for most companies is not going to be generating sufficient ideas on how to move forward. Rather, it is aligning and prioritizing those ideas to determine where and how much to invest to secure their place in the future of pharmacy.

To learn more about future of pharmacy potential archetypes, explore other customer journeys, or talk about our hypotheses about where to invest today, contact us.

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Endnotes

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