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mHEALTH

Patient Adherence Tools Get Personal

From blister packaging to text reminders, mHealth technology tools are helping drive patient adherence.

A characteristically slow-moving pharma industry is being hit with technology that is changing at warp speed. How companies prepare for the coming years of groundbreaking innovations in healthcare technology will be crucial in maintaining their relevance to both physicians and patients. The connectivity of everything — the Internet of Things — that is bearing down on the industry is going to drastically challenge its — and the world's — approach to healthcare.

From electronic health records to remote monitoring systems, from telemedicine devices to health tracking wearables, stakeholders will be exchanging information in ways and at a depth never before experienced. The ultimate goal of this connectivity will be to provide the backdrop for a more proactive system of healthcare, from the point of view of all participants: pharma, providers, payers, and patients.

As the word "connect" implies, this linking of all parties will create new relationships among the players, and produce volumes of data that can be used to facilitate better outcomes: by pharma to improve the discovery and manufacture of its drugs, by doctors to more effectively prescribe, by payers to more cost efficiently reimburse, and by patients to better manage their diseases.

While there are many innovative tools emerging to assist in healthcare administration, none more than the smartphone will influence how healthcare information is delivered and consumed. According to a study by Manhattan Research, about 95 million Americans used their mobile phones in 2013 either as healthcare tools or to find health information, an increase of 27% from 75 million in 2012. Many respondents reported that their smartphones were an indispensable source of healthcare information, with 38% of smartphone users saying their device was essential for finding health and medical information.

Mobile technologies can enable continuous monitoring that allow caregivers to assess patient conditions around the clock and provide continued feedback on the patient's status, whether monitoring a specific event like blood pressure or heart rate, or monitoring general vitals, says Marc Perlman, global VP, Oracle Healthcare and Life Sciences.

"Through mobile devices, patients and providers can also change the way care is coordinated and delivered by providing easy access to medical records, patient visit history, immunization records, and the like, which will enable the patient to know when they are due for a checkup, or provide the doctor with the ability to follow up via mobile technology when a patient is due for their next interaction with the health system," he says.

Consumer Engagement Key to Connected Health

Mobile technology provides clinicians, care managers, and the entire care team with real-time patient updates, reporting, and trend monitoring through a single, convenient platform. Real-time patient engagement is critical to the improvement of outcomes and quality of care, and the industry has not quite learned that lesson in more than two decades of disease management efforts, says Napoleon Monroe, managing director, New Directions.

"Providing immediate, point-of-patient reinforcement to change patient behavior is crucial," he says. "After the patient has the medication, in most cases, the true point of care for pharma products is wherever the patient happens to be. When the patient is outside a healthcare institution, the providers and pharma have essentially lost control of care. Later stages of the HIMSS EMR adoption model will include continuity of data from ambulatory patients."

Most importantly, this real-time information identifies patients most in need of immediate outreach and intervention. For example, the key to managing diabetes and reducing hospitalization and cost lies in identifying those whose blood sugar is out of control or patients who are not testing at all.

"The real-time data feed, combined with predictive analytics, empowers care team members to stay connected with patients outside of traditional care interactions and to provide individualized support and coordination based on each patient's rapidly changing health status," says Jonathan Javitt, CEO and vice chairman of Telcare, a provider of mobile diabetes management solutions. "In addition, this information can be shared not only with care team members but with family and friends, providing an entire ecosystem of care around the patient."

Applications that automatically upload readings to other social applications, such as connecting and posting to Facebook, combat the social isolation of chronic conditions and give people a sense of community, belonging and accomplishment, he adds.

The solutions that are most effective in driving patient engagement are those that focus on building skills and habits that stick with patients beyond the length of time they engage with the technology, says Kyle Sutton, senior digital strategist, MicroMass Communications.

"This can be accomplished through experiences that offer intrinsic rewards for patients versus extrinsic rewards such as coupons, prizes, and products," he says. "With the popularity of the quantified self-movement, many in pharma have responded by giving patients an arsenal of tools for tracking their progress in every category from blood glucose to weight loss to depression."

FDA Med App Guidance

In late 2013, the FDA issued its final guidance for mobile medical application developers.

The agency will pursue limited regulation of health and wellness applications that help patients to self-manage their conditions. Instead, the FDA will focus efforts, including the application of risk-based standards, on diagnostic and quasi-medical device applications.

◥ *For more information on the guidance, visit http://www.fda.gov/downloads/Drugs/.../Guidances/UCM269919.pdf*

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"The solutions most effective in driving patient engagement focus on building skills that stick beyond the engagement with the technology."

The challenge with this approach is that it's only valuable to people for whom closely tracking disease/wellness metrics is already appealing. It isn't particularly helpful for those who aren't interested in tracking metrics and it doesn't drive lasting behavior change.

Digital access can also drive improved participation and outcomes on the clinical side. Not only are physicians better informed from real-time patient data, but also mobile apps and tools give pharma huge advantages in clinical trial optimization, says Sheila Rocchio, VP of marketing and product management, PHT Corp.

"The ease and simplicity of mobile apps are the best way to engage patients and collect compliant data," she says. "They improve patient engagement, which improves compliance. Mobile apps enable sponsors to conduct clinical research with massive patient populations and provide tremendous flexibility to deploy Phase II, III, and IV clinical studies and post-market and observational research that collects patient data."

According to Ms. Rocchio, PHT knows this first hand as it has launched a mobile app for collecting outcomes using patients' own Apple and Android smartphones. Patients download the app with a simple link and activation code provided by a clinical investigator site. Drug companies can discover how patients are feeling in real time and this input makes a huge difference in the drug development process to get new drugs approved.

"Pharma can reduce hardware costs and lo-

SHEILA ROCCHIO · *PHT*

"Smartphone apps currently provide the best platforms for engaging patients and collecting compliant clinical data; they are easy to use and are already integrated into daily life."

gistical issues by deploying clinical studies on the hundreds of millions of existing Apple and Android smartphones and tablets patients already own and love," she says. "And, pharma researchers can be confident in the scientific and regulatory compliance using mobile apps

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"Real-time patient engagement is critical to the improvement of outcomes and quality of care."

that detect the necessary phone characteristics of display to ensure appropriate display and consistency across the user experience." **(To read more on how smartphones and mHealth tools impact clinical trials, see bonus content.)**

Games in Connected Health

Serious healthcare games make use of the recreational motivation to convey a message, teach content and practices, rehabilitate users, or provide useful experiences. Entertainment is not the primary goal; instead, serious games are designed to get people to do things they wouldn't normally do on their own, like adopt better health behaviors or choices.

The practice of using game mechanics will become a significant part of connected health, due to a game's tracking, measuring, and social capabilities. These elements make games an effective format for changing behaviors, so much so that the creators of Guitar Hero have ventured into the health gamification vertical, releasing GojiPlay last year, a cardio fitness game that connects wirelessly to cardio equipment through a clip on an activity sensor. The app allows users to play a variety of games, all while tracking fitness metrics. Other health games with a similar purpose — making it fun to be healthier — include Zombies, Run!, and the soon to be released Race Yourself for Google Glass.

The trend is bolstered by game creating companies that have developed specific platforms with customizable applications that make it easier to incorporate gamification elements into a compliance goal. Monster Manor,

a game to help young children with type 1 diabetes better track their glucose level, uses such a platform from game maker Ayogo.

From physician training and education, to facilitating better compliance for both physical and medical therapy, games have been proven to be an effective tool for improving patient outcomes.

"Gamification has the potential to drastically improve the way companies drive a targeted behavior in a patient population," Mr. Sutton says. "More specifically, it helps meet four key objectives that often stand as barriers to driving desired health outcomes and behaviors."

Mr. Sutton outlines those four objectives, starting first with serving as a guidance mechanism. Patients seeking to improve their habits in the context of a chronic disease, such diabetes, are often overwhelmed by the volume of changes they have to juggle over time. Gamification holds the potential to take a long list of complex tasks and serve them up as directives that are both approachable and manageable, he says.

Second, gamification can serve as a skill-builder if progressing in the system is tied to mastery of disease management skills. Ideally, the system provides a clear path from in-system learning to real-world application. Gamification also serves as a motivational mechanism. The process of achieving mastery through skill building is intrinsically motivating and in some instances there is potential for extrinsic motivation through real and virtual rewards, he says.

"And lastly, gamification can serve as a quantifier of patient progress," Mr. Sutton says. "Patient engagement can be linked to progression metrics within the gamified system. This potentially yields a proprietary metric of success that can serve as a clinical proof point, to reveal new patient challenges and opportunities and to inform new content and future iterations of the gamified system."

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"Mobile technologies stand to drastically change care coordination."

According to Mr. Javitt, the same human emotions that are harnessed by the ever-expanding computer gaming industry can be focused on improving patient engagement.

"Computer gaming approaches can be used to motivate people toward better adherence by providing an interactive, rewarding and fun user experience," he says. "For example, patients can be incentivized to set weekly goals and take frequency challenges in order to earn rewards that can be redeemed for merchandise with online retail partners."
(For more information on gamification, see our January 2014 article "What's in a Game?")

Wearables Market Set for Growth

According to Accenture reports, fitness devices make up the vast majority of the wearable technology market at $1 billion to $3 billion today. As devices evolve to be more convenient to wear and use, the market could more than double to $8 billion by 2018. Forrester Research reports that 25% of more than 4,500 American consumers surveyed reported they would wear sensors, although only 4% of those respondents are currently using fitness trackers. The Accenture Digital Consumer Tech Survey 2014 revealed that 52% of consumers in six countries, including the UK, are interested in buying wearable technology, particularly for health and fitness reasons and 46% might use smart watches and 42% seem interested in Web connected glasses. Whatever form they take — glasses to wristbands and watches to bras and Tshirts to earpieces and clip on sensors and cameras — wearables will have a strong presence in connected health in the coming years.

"Five years from now connected devices will be routine, and 10 years from now unconnected devices will be obsolete globally —possibly even sooner," Mr. Javitt says.

"The basic technology that drives these solutions will get less expensive, be easier to assemble, and will be continuous and nonintrusive," he says. "We're already beginning to see biometric devices worn as watches and shirts, and some can even be taken in the form of a pill, sending the patient's internal readings to a mobile device." **(For more information on technology advances being made, please see Innovators' Corner.)** **PV**