



Wellness Game

Pharma has reduced the burden of disease. It can develop a condition-specific app. But getting people to take their medications as prescribed? That's another matter. **Larry Dobrow** on why biopharma is backing mobile games for their potential to boost adherence and drive behavior change

Pharma has solved, or at least cut down to manageable size, many problems. Once-feared diseases have been rendered impotent. Bona fide health scourges have been sent the way of the dodo bird. And yet one problem remains frustratingly, intractably resistant to just about every potential antidote: adherence.

Pharma is adept at developing pills and balms, and equally skilled at marketing them in most media environments. What it can't do, billions of hours of effort and dollars of resources notwithstanding, is change human behavior. It can't prompt patients to take their medications at the appointed hour and refill their prescriptions at the appropriate date. It can't make them get with the program, so to speak.

"Adherence is, without question, the number-one health problem in the world today. There aren't too many others that are close," says Michael Fergusson.

Fergusson is neither a physician nor a health-policy wonk, nor has he spent much time on the ground in sub-Saharan Africa. Rather, as the CEO of Ayogo, a company which attempts to apply the behavioral psychology of games and play to the management of health issues, he is equal parts insider and outsider.

He's an insider owing to the work his nascent firm has done with some of pharma's biggest guns, among them Merck and Sanofi. He's an outsider because, well, Ayogo makes games, and pharma has historically viewed games as a trifle, as suited for nothing more crucial than product marketing and sales-force training. Games as a possible adherence salve? Please. Pharma folk would just as soon buy into a telegraph-based solution, or one that involved an extensive series of lectures.

"In so many people's minds, there's a real stretch in believability—just the word 'game' and what it implies in terms of seriousness," says David Ultan, director of digital communications and integrated brand management at Genentech, which financially backed (through its Genentech Foundation) the second iteration of HopeLab's Re-Mission mobile game for young cancer patients, a simulation that places them at the center of their treatment plans. "The idea of gaming as a diagnostic tool or as something that helps with adherence isn't a natural idea for a lot of people. There's a real trepidation and a pause."

One would think everyone in the healthcare universe would embrace anything that would help combat the adherence problem, especially given the financial strain it imposes on a stressed system. Last year's National Community Pharmacists Association adherence report card estimat-

ed that non-adherence grows health-related costs by about \$290 billion per year; IMS's Institute for Healthcare Informatics estimated that the "avoidable cost opportunity" from non-adherence was \$105 billion.

"Virtually every major constituency in the US healthcare industry has a vested interest in improving the rates of adherence," says Jason Oberfest, co-founder and CEO of Mango Health, makers of an app that helps users manage medications and track health-related goals.

Though late to the game, pharma has started spending in the mobile sphere. For the first time, the pharma business made an appearance on Millennial Media's "Scorecard For Mobile Advertising Reach and Targeting" report's top-10 list of mobile advertisers by industry, ranking 10th. Year over year (third quarter 2013 vs. third quarter 2012), pharma grew its spending by 744%, the largest growth for any business vertical. Now, much of that additional spending was likely devoted to game or app development, but the numbers are heading in the right direction for the surging minority who view mobile as pharma's next marketing frontier.

Even better for that group of mobile-philes, many major pharma companies appear to be clamoring for a seat on the bandwagon. In addition to Genentech's support of Re-Mission, Merck is working with Ayogo on a diabetes project, Sanofi and Ayogo have unveiled their jointly developed Monster Manor game for families of children with Type-1 diabetes in Europe, and the Eli Lilly/Boehringer Ingelheim diabetes alliance has been roundly hailed for its Complications Combat online/tablet game, designed to better educate ex-US Type-2 diabetes patients and their caregivers.

"I can only speak from a UK perspective, but a mobile-first strategy is paramount for us," says Andy Browning, head of the project management office and digital project manager at Sanofi UK, who served as the company's digital lead on Monster Manor. "It's important to us to be supporting innovation, and mobile games is one of the places where you're seeing that really strong innovation."

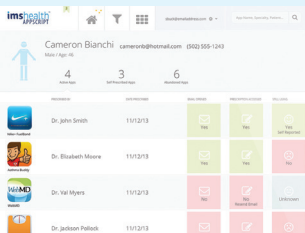
Kevin Cammack, senior marketing director in Lilly's US diabetes unit, agrees. "For me specifically, I'm



Curators aim to tame app proliferation

The good news: the mobile health space is growing exponentially, with some estimates putting the number of available apps in excess of 40,000. The bad news: well, the mobile health space is growing exponentially, leaving patients, caregivers, physicians, developers and every other interested party to trudge through the app morass largely on their own.

At this time last year, the market was begging for some kind of curation—and a few organizations have heeded the call. Cigna and SocialWellth partnered on the Go You app marketplace, which offers reviews and a Cigna stamp of app-approval (sorry); WebMD is set to debut a health device marketplace before the end of the first quarter. But these two entities aim at a broader audience—which is why IMS Health's new AppScript service is so interesting to



practitioners and web developers, its primary targets.

AppScript aims to help doctors match patients with appropriate apps and give would-be developers technical and security/privacy frameworks in which to work. “We went into this hoping to make sense of and industrialize the process of the right app for the right patient at the right time,” says Matt Tindall, IMS Health’s director of consumer solutions.

It proved a challenge due to wild variations in app content and quality. Tindall scoffs at the oft-reported figure of 40,000 health apps. To birth a tool that would cut through that clutter, IMS tapped what Tindall describes as “a big, big team” to catalog and characterize the tens of thousands of health apps. What the company found, frankly, wasn’t impressive. “Maybe two-thirds [of the 40,000] are actually health apps. And most only provide the most basic of information.”

The first iteration of AppScript, which debuted in January, should prove a godsend for practitioners in particular, not only because it serves as a recommendation engine of sorts but also because it takes pains to preemptively assuage concerns about privacy and security. When physicians enter the AppScript portal, either through EMRs, a mobile device or a desktop, they can find and prescribe an app. The prescription arrives as an encrypted email or text message, with a PIN code that links to the appropriate Apple or Android store.

“Many physicians are prescribing apps through their personal email or script pads. If you’re a patient with a condition that you’d want to keep private, that’s not optimal,” Tindall says. As for concerns about the reliability of AppScript’s rating system, Tindall dismisses them with a half-serious, “Hey, we’re Switzerland. We’re unbiased. We’re taking our insights and sharing them with the ecosystem, that’s all.”

Additionally, AppScript will, at least in theory, help parties in the healthcare chain figure out which apps are working and why. Already IMS is doing its share of app consulting, hoping to answer that question for pharma companies, payers, providers, pharmacy chains and developers. Whether app engagement will prove a proxy to eventual health outcomes is anyone’s guess, but Tindall believes that, at the very least, AppScript will provide clarity to the app-prescribing process. “Physicians, I think, are going to realize that prescribing a mobile medical app is very similar to prescribing a drug.”

in a position now where it’s, ‘Let’s make sure our tactics, whether games or anything else, in the mobile environment actually work in the mobile environment,’” he jokes. “That said, the way we operate is to ask, ‘What’s best for our patients?’ From everything we’ve seen, these technologies do engage them. They help them learn more effectively than other paths do.”

That doesn’t imply mobile games are on the verge of revolutionizing healthcare or relegating adherence problems to history’s dustbin. There are still obstacles to get past, one of which Cammack identifies above: creating any mobile game, much less one that can effect behavioral change among populations long resistant to such changes, is an incredibly involved task.

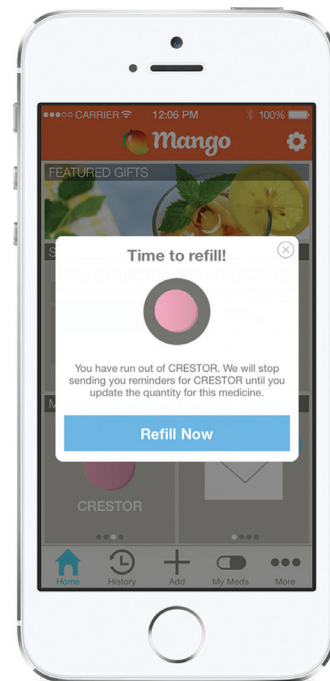
Take the Mango Health mobile app—which gives points to users who take their medications on time, and lets them use those points for gifts and charitable donations—as an example. The app asks users to input their medication and/or nutritional supplement schedules, and uses that information to provide reminders and steer clear of dangerous drug interactions. This alone would seem to require quite the volume of information, and that’s before technical and aesthetic specifications come into play.

“In theory, it’s easy to say, ‘What we want to do is have really, really simple and compelling product design and make using the app completely effortless,’” Mango’s Oberfest notes. “In practice, that’s near impossible—to put all this information in simple formats that look good and are readable on mobile devices.” This challenge, perhaps, is why pharma lags other industries in the creation of apps and games: they don’t have the skills under their roofs.

That also explains why Merck, Sanofi and others have teamed with nascent companies like Ayogo, which have the technology and behavioral-science parts of the equation down pat. Of course, that often leads to what Fergusson calls “mismatches of scale,” where a small entity and a monolith struggle to work with one another.

Fergusson is quick to note that collaborating with Sanofi and Merck has been “a pleasure. They’ve helped us navigate through their processes and made sure we know well in advance all the approvals that were going to be necessary.” At the same time, he considers those experiences the exception when working with global companies. “We’ve had [companies] come in at the last minute and say, ‘We need to do a security evaluation tomorrow—our people will be there at 8 a.m.’ There’s no sense on their side that something like that can disrupt everything we’re doing. We’re little and they’re big.”

The big guys face other problems as well, especially when it comes to selling the notion of mobile health games internally. While there are the aforementioned successes on the board, none remotely qualifies as a blockbuster; even a few thousand Monster Manor downloads was enough to prompt its backers to exchange high-fives.



And though the industry is watching the Pfizer/Akili Interactive partnership—the companies are testing whether an Akili game might help detect early signs of Alzheimer’s disease in healthy adults (see sidebar)—it’ll be a while before any other company or developer can point to it as a sign that games have value as a clinical tool.

In the absence of the everyone-else-is-doing-it-so-why-can’t-we? arguments that often sway the conversation, then, how can mobile game enthusiasts make their case? Becky Reeve, head of professional relations for Sanofi Diabetes in the UK, reports encountering little internal resistance. “The idea of getting that first-mover advantage is something that can resonate” with internal audiences, she says.

Having an armful of research and statistics handy—specifically, information about consumer embrace of all things mobile—can’t hurt, nor can heartfelt appeals. “You can’t come out and say, ‘This works, I guarantee it.’ What you can do is sketch out the potential,” Ayogo’s Fergusson says.

Geoff McCleary, VP/group director, mobile innovation at Digitas Health, cautions mobile game boosters not to oversell the genre. “If you do a game about running away from zombies, can that improve [players’] health? Sure. But it’s hard to go into a room and say that without proof, in terms of improved outcomes,” he explains.

Studies by HopeLab suggest that patients who played Re-Mission were more adherent to their treatment and had better self-efficacy (a concept found in psychology that measures how well people believe they can complete their own goals), and that participatory engagement in game play activates the reward-related neural circuits.

Yet Genentech’s Ultan injects a similar note of caution: “Digital communications are not on everyone’s mind all the time. It definitely requires some evangelizing to the organization and building a business case for what you want to do. Some people just don’t get the consumer part of it. If you’re a big pharmaceutical company,

you’ve done pretty well for yourself selling drugs without the need [to worry about] consumers, really.”

Just as pharma companies are monitoring potential mobile game successes, they’re paying close attention to the regulatory and legal travails of first movers in the space. Should the FDA or an overseas authority rule that a game doesn’t pass regulatory muster, that could make already hypervigilant internal taskmasters even more reluctant to give their thumbs-up to a project.

Reeve of Sanofi UK, for one, feels eyes on her back. “Other people are watching us with avid interest, just to see if there are regulatory issues,” she says, almost cheerily. “The thing is, there’s nothing [in the rules] about games or gamification. It’s uncharted territory, really.” Nonetheless, being the first to attempt to navigate the regulatory waters, she points out, has its upside. “The whole diabetes community can see that we’re out there and that we’re forward-thinking.”

A final hurdle for would-be mobile health game developers is borderline philosophical in nature: How game-y should a game be? The question isn’t as silly as it sounds. Developers point out the difference between a game-game (one that has plots and levels and demands strategic thinking) and a gamified app (one that rewards random activities with points and badges and whatnot).

“There has to be some underlying mechanics,” Fergusson says. “Points and badges, if that’s what you’re using, have to represent something meaningful.” Of course, game and app makers can’t skimp on the aesthetics. “In the healthcare and pharma space, science is the king of the realm. Making pretty pictures and beautiful interfaces—those are things healthcare traditionally hasn’t been all that good at,” Oberfest notes. Fergusson agrees, deadpanning that, “Software is a little different from molecules.”

When discussing mobile health games with pharma execs and developers, Fergusson’s notion of “meaningfulness” comes up often.



Mango Health’s app (opposite) gives points to users, who take medications on time, that they can redeem for gifts; left: HopeLab’s Re-Mission 2 simulation, which has been associated with behavioral and biologic change, targets young cancer patients, while Ayogo’s Monster Manor (p. 31) and BI/Lilly’s Complications Combat (p. 30) focus on type 1 and type 2 diabetes, respectively.

Can games serve as clinical tools?

In January, when Pfizer and Akili Interactive announced a partnership to explore whether Akili's Project: EVO game (pictured) could help detect early signs of Alzheimer's disease, mainstream pundits were dazzled. An iPhone game can do that? Take that, Candy Crush Saga! If the study confirms that the game has that neurological utility, it would be a step forward for those who believe that mobile games could serve as clinical tools.



But such efforts are hardly novel. It was a decade ago that technology wonk and gaming zealot Ben Sawyer co-founded the Games For Health Project, devoted to uniting forward-minded healthcare people with top-tier game developers in the

interest of creating game technologies to improve individual health and the delivery of healthcare. During that time, Sawyer has been both cheerleader and beneath-the-hood tinkerer, splitting his days between his Games For Health advocacy and clients who hire him to create so-called "serious" games.

When Sawyer looks at Akili's work, he's impressed and encouraged. "A cognitive health application that revolves around attention and focus—that's important," he says. At the same time, he cautions those who believe that academic/science gaming efforts are ready to explode into view.

For one thing, there's the traditional hesitation of pharma and healthcare companies to embrace The Next Big Thing. "This is still an area of development and activity that is deemed risky for established companies," Sawyer shrugs. "They're trying to figure out where to take the plunge."

To date, games have largely been viewed as most useful as a marketing tchotchke or as a tool to train sales forces. Games have also been bumped down the priority ladder by social media. "Games are much more complex," Sawyer says. "They require more effort to get right."

Sawyer is heartened by the fact that organizations across the healthcare and pharma world are tapping the gaming and academic communities to support their endeavors. Most of the extant games are what he calls "narrow-casted": designed for individuals with a specific health status or disease state, and thus limited in their ultimate reach. Sawyer hopes to push the various communities to think more broadly about health.

Games For Health is continuing work on a series of papers and projects that, it hopes, will make it easier for interested parties to build health games. The idea, in Sawyer's words, is to "create an ecosystem of tools and capabilities." Doing so will improve the games, and widen their potential audience.

"The kind of games that will catch on are the ones that involve a narrative, the ones that require skill-building and strategic thinking, the ones that are immersive," he continues. "They're the kind of games that, when my kid looks at it, he recognizes it as a game."

As for audiences, Sawyer has his sights set on "the people who are sort of taking care of themselves, but aren't workout fanatics or athletes. All that we're giving them right now is counting their steps. Not that counting steps can't be a good data point, but it's less engaging than 'I finished that level' or 'I completed that story.'"

These games aren't about playing for the sake of playing; they're about triggering behaviors and practices that will improve users' health. Injecting a degree of meaning into a mobile game ranks among the more challenging tasks for anyone in the mobile gaming game.

The first thing to remember is that it's impossible to create an effective mobile health game in a vacuum. A company might be able to assemble a dream team of scientists, developers and behavioral psychologists under a single roof, but without user input at every step along the way their efforts are likely to be futile.

While designing Monster Manor, Ayogo brought in young diabetes patients to talk with its software developers. "You speak with parents and the first thing they tell you is that they can't get kids to engage with their treatment programs," Fergusson notes. "Well, that's probably because the kids haven't had anything that speaks to them in their language. Mobile games clearly do that."

To that end, Sanofi hosted a play day for children suffering from Type-1 diabetes and worked with Diabetes UK, a patient-support organization, as it calibrated the tenor of the Monster Manor project. "Patient organizations, frankly, are much more forward-thinking than companies are. They're very specific about what they want from apps, from treatments, from everything," Reeve says.

Oberfest, who has spent his entire career working on consumer-facing products that influence behavior change, cautions all comers not to underestimate the influence of community validation. While the Mango app dotes on adherence—are users refilling their prescriptions on time?, etc.—he's quick to note the importance of its social features.

"Simple social comparison should be a big part [of any game or app]. For each medication or supplement, we give users a simple view of how they're doing at a prescribed regimen compared to everyone else in the community on that same regimen," he says. "It's the co-op model: tying individual performance to overall community performance."

And then there are the tonal concerns, which Lilly's Cammack articulates by saying, "You have to make sure you're not trivializing the experience that a patient is having, especially with chronic disease."

As for what's next, look for pharma companies and healthcare groups to attempt to expand the purview of mobile health games beyond single disease states. While games like Monster Manor, Re-Mission and Complications Combat do a fine job of effecting patient and caregiver behaviors, they're targeted at narrow populations.

An IMS Institute For Healthcare Informatics study, "Patient Apps for Improved Healthcare: From Novelty to Mainstream," suggested that most apps focus on a single disease area. Patients dealing with a variety of ailments, the study concluded, aren't going to want to juggle numerous apps—which means that low download rates (500 and fewer) are likely to result. This, in turn, could make it more challenging for mobile game advocates within pharma companies to justify financial investments in such games.

In the end, mobile health game creators shouldn't forget the lesson about games that they probably learned before they reached grade school: namely, that games oughta be, you know, fun.

"There's this sense within the health field that if something is important, it has to be dreary—as if fun detracts from the seriousness of it," Fergusson says. "That flies completely in the face of everything we know about psychology. If there's a more obvious place to bring some fun and interest into, I don't know what it is." ■