New $10 million X Prize launched for tricorder-style medical device

In the fictional universe of the *Star Trek* TV series, Starfleet doctors routinely diagnosed their patients on the spot using boxy, gray, handheld devices called tricorders. But gadgets like these could be available much sooner than the twenty-third century thanks to a newly announced 'X Prize' for mobile diagnostics, which boasts a $10 million award.

Run by the telecom giant Qualcomm and the X Prize Foundation—a California nonprofit behind several big-money competitions in genomics, space exploration and clean-energy technologies—the aptly named 'Tricorder Prize' aims to reward the inventor of a single portable device that, without human input, can diagnose an array of diseases with the same level of accuracy as a panel of physicians. Although the specific medical conditions haven't yet been selected, they will be challenging, organizers say, ranging from metabolic syndromes to infectious diseases to neurological conditions.

Last month, around 40 healthcare and medical technology experts met near Qualcomm's headquarters in San Diego to begin the six-month process of fleshing out the final requirements for winning the prize. According to Don Jones, vice president of business development for Qualcomm's health and life sciences division, everyone agrees on many of the basic parameters: the device has to be portable, minimally invasive, fast and scalable. But working out the finer points of the rules is proving time consuming. "Would drawing blood negate our premise of being noninvasive? What if the process for drawing blood is painless?" Jones asks. "It's a teeter-tottering that goes back and forth."

Live long and prosper: The X Prize's inspiration.

The winning device will probably require some new engineering. But the hardest part, argues Darrel Drinan, founder and chief executive of the San Diego–based mobile health technology company PhiloMetron, will be developing new computer algorithms to interpret biological readouts and provide accurate diagnoses for a wide range of disparate diseases. "All kinds of monitoring tools and technology are being developed at an extraordinary rate," Drinan says. "What's not developed are the analytics for the data."

One of the many debates at the June meeting was whether healthcare providers will love or hate the winning device—they could welcome the drop in doctors' visits from patients not needing treatment, or they might resent their expertise being superseded by artificial intelligence. Philip Low, founder and chief executive of Neurovigil, a La Jolla, California–based technology company that specializes in brain recording, however, summarily dismisses the technophobes. "If it makes health care better," he says, "it's something that should be embraced by physicians."

In the end, the winning design should have an impact in both developing and industrialized countries, argues Low. "The idea here is to provide better care to people with access to health care, as well as health care to those who don't have access," he says.

Hannah Waters

FDA approval signals more 'homework' on the horizon in trials

A growing number of people use technology to share the minutiae of their lives with others, detailing everything from the calories they consume, to the distance they run, to their point in the menstrual cycle. And clinical researchers are increasingly trying to harness this compulsion to divulge biometric data online. Now, with a 7 June go-ahead from the US Food and Drug Administration (FDA) for the country's first completely at-home trial of a drug, the trend has come to the fore.

In a proof-of-concept study, a group from the University of California–San Francisco and New York–based Pfizer will trod through a trial of the company's drug for overactive bladder, Detrol (tolterodine). The drug received approval for this indication in 1998; as such, the trial is simply to see whether a home-based trial can work. Participants will be recruited online and, with the exception of blood tests bookending the trial period performed by a visiting nurse, the participants are on their own. They will receive their pills in the mail and log their bladder activity through a mobile phone app.

Craig Lipset, Pfizer's head of clinical innovation, came up with the concept for the trial a few years back and, surprisingly, ran into relatively little trouble getting it off the ground. The meeting with the FDA was packed with representatives from both the agency and Pfizer, and he says that the FDA "took the attitude of, 'This is a really unique opportunity; let's all learn and evaluate as much as we can.'"

Proponents have touted at-home trials as cheaper and say this approach also holds the promise of reaching a broader demographic. Plus, although this type of study will never replace trials involving acute and life-threatening illnesses, "it may make a lot of sense for chronic illnesses," says Kenneth Getz of the Tufts Center for the Study of Drug Development in Boston. "It's something more to add to the whole arsenal of approaches that can be offered to patients to make it easier for them to participate in trials."

The Detrol trial is just one piece of a larger trend of putting social media and the mobile web to use for trials. On 9 June, PatientsLikeMe, a health data sharing company in Cambridge, Massachusetts, announced a new web feature connecting patients to relevant clinical trials by aggregating information from ClinicalTrials.gov daily, hoping to expand trial access to those less in the know. Meanwhile, drug-adherence text messages and medical tools, such as a cell phone microscope and mobile ultrasounds, are being tested in Africa.

Despite the enthusiasm for home-based trials and hopes to reach a diverse participant group online, some worry that these studies will only capture a health-conscious online demographic. Still, Lipset remains optimistic. "It takes a certain amount of time before patients and users are ready for those tools, and we think now that time is right."

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