



Wired Health: how do we harness self-monitored health data?

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Self-Monitoring

Conferences

Medical Innovation

Featured Article 

On April 29th, health enthusiasts, entrepreneurs and scientists converged on London in the UK for [Wired Health](#), a 1-day summit focusing on upcoming trends in the medical and personal health care industries. And the message was clear: wearable tech and self-monitoring are taking the industry by storm. But in the wake of all the exciting new technology, how can we harness the data we collect?

Presenting to an auditorium packed with hundreds of medical professionals and supporters, John Coates, from the University of Cambridge, invoked an ancient Greek aphorism when he said, "Know thyself."

But in the case of self-monitoring, he added, knowing yourself means knowing your individual biology.

And indeed, the last year has seen a multitude of self-tracking products enter the market. *Medical News Today* has reported on [skin-mounted monitoring devices](#), a [smartphone case that measures key vital signs](#), a ["smart contact lens"](#) that helps diabetics and even a [tooth sensor that detects oral activity](#).

But with all of this individualized health data suddenly within our reach, the question of how to harness this information into actionable health outcomes has entered the forefront of the medical landscape.

In this feature, we examine the research presented at the Wired Health event - as well as some of the new products from start-up companies - in order to gain a better understanding of where the health care industry is heading.

Using knowledge as a reward, not a warning

"At any point, you can change the [health] outcome, until it's too late," said Dr. Tali Sharot, of University College London, as she presented recent findings regarding risks we take with our health, even in the wake of warnings.

With the influx of self-monitoring technologies entering the market, we now have the ability to track our vital

signs and detect potential warning signs uncovered by our own health data.

But Dr. Sharot cautioned that focusing on bad outcomes does not necessarily encourage positive changes in our lives. In a 2013 study, she and her colleagues demonstrated that kids and teens are the worst age group at learning from negative information.

For example, focusing on the negative outcomes of smoking - such as the potential for developing cancer in the future - does not seem to have a significant effect on how adolescents curb their behaviors.

Though Dr. Sharot noted that adults are able to learn from negative information, once we hit 40 years of age, we again regress and become worse. But the ability to learn from good information is fairly constant throughout our lives, she added. In the smoking example, good information could come in the form of thinking about how you will be better at sports if you do not smoke.

As such, she recommends that instead of using warnings about bad outcomes in the future, we should focus on immediate rewards, social incentives and progress monitoring, which can be achieved through self-monitoring devices.

Using these tactics, we imagine a future that will be better than expected - information Dr. Sharot said our brain better processes.

"Almost all health campaigns are fear campaigns," she said, adding that we need empirical studies on what works best for better health outcomes.

Speaking on health outcomes linked to place, Bill Davenhall, a health expert with 40 years' experience in the industry, asked the audience how well they think they know their place.

By place, he means where a person has lived throughout their life, as each location has its own environmental history (i.e., "sick buildings," locations with environmental pollution, etc.).

"Medicine hasn't used used geographically relevant data to provide a complete picture [of health]," he said, adding that physicians should be made aware of the complete geographical history of the patient, in order to understand potential health risks.

Davenhall calls this focus "Geomedicine," and his company, Esri, has an app called My Place History, which allows the user to input their postal code to receive a personal place history assessment.

Taken in conjunction with information about DNA and lifestyle, he believes personalized data on environmental exposure is the missing key in understanding disease on a personal level.



Bill Davenhall speaks about "Geomedicine" at the Wired Health event.

Though his belief that, in the future, individuals will choose where to move based on environmental reports seems a bit far-flung, he has a point: "There is no randomness to disease."

Global health monitoring

But monitoring can extend beyond the individual, to the collective. In the example of mass outbreaks, the ability to track disease progression in real time provides health practitioners with invaluable data.

Jonathan O'Halloran, from [QuantuMDx Group](#), used the example of the 2009 H1N1 "swine flu" outbreak, which caught the global medical industry off guard. During this time, there was not enough data available soon enough to contain it, he said.

To solve this problem, his company seeks to tackle the issue through networking. Their device Q-POC™ provides the accuracy of a referral laboratory at the patient's side, at a fraction of the cost and in a shorter time period.

The device works by breaking open cells to analyze DNA, while a Q-filter separates the mixture in only about 15 minutes, compared with the days this process currently takes.

Using the knowledge of what illness they are faced with, medical professionals can report an outbreak immediately, enabling health organizations - such as the World Health Organization - to contain its spread.

Along a similar vein, Jack Kreindler, of [Jointly Health](#), presented their remote patient monitoring platform, which he said can detect changes in a patient's health months in advance.

The company notes that wireless biometric sensors are becoming cheap, accurate and widespread. But though this data "can be used to dramatically alter the way we understand and manage chronic disease," turning this data into usable information can be tricky.

To solve this problem, Kreindler's company has created a next-generation platform so that health care professionals can act on any patient changes before a major health problem develops.

And this is all done by remotely monitoring patients and analyzing the data produced. Though Kreindler believes their platform can transform many different aspects of health care, he added:



"We have to tackle the complex diseases first that cost the most and hurt the most people, such as [chronic obstructive pulmonary disease] and cancer."

Self-monitoring goes cute, cuddly and digestible

One of the cutest pieces of monitoring equipment from the show came in the form of a cuddly teddy bear.

Teddy the Guardian, developed by Josipa Majic and Ana Burica, is disguised medical technology in a toy, designed for children in a health care setting or at home.

Equipped with certified medical sensors, Teddy captures important data - such as heart rate, oxygen saturation and body temperature - through his paws and sends it via wireless technology to a pediatrician's app.

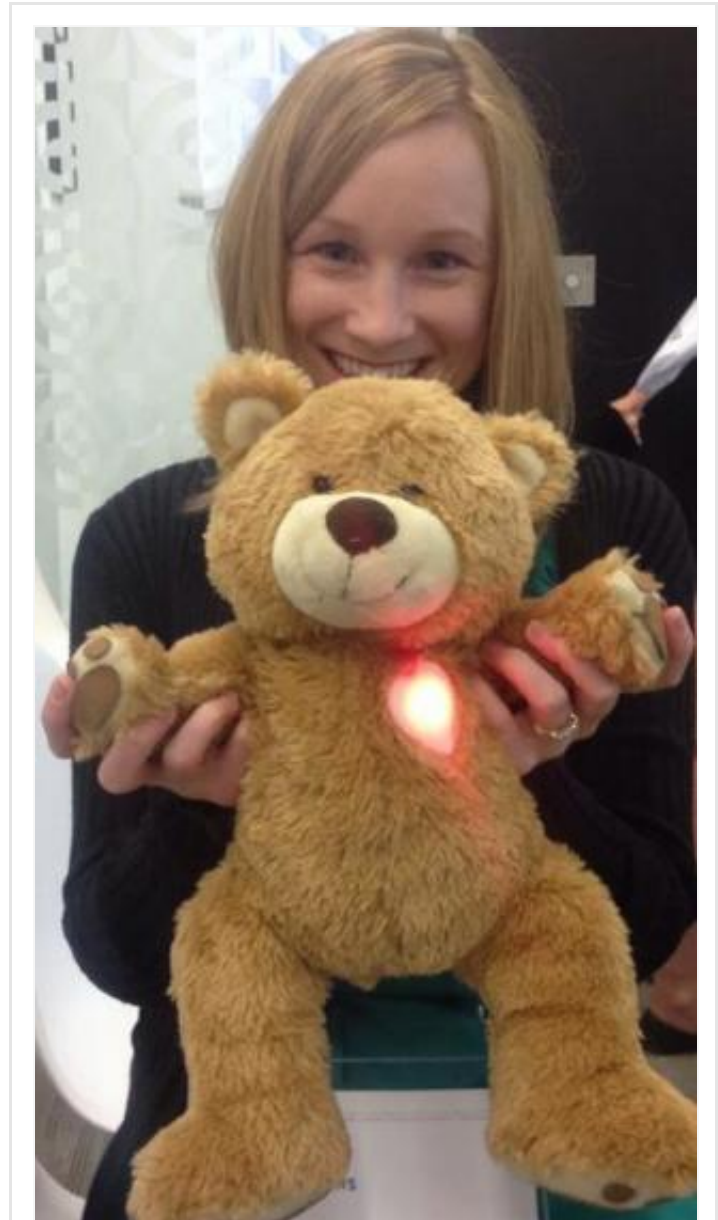
So all the child needs to do is hold Teddy's paws, rather than confront a thermometer or medical machine, which can be quite stressful.

Speaking with *Medical News Today*, Ana Burica explained that the bear provides a child-friendly approach to gathering data, which can be skewed by stress:

"We're making it familiar, acceptable and packaging it in that way."

Through infrared light, Teddy can monitor oxygen levels, and a newer version of the bear comes with a heart that lights up either green, yellow or red, depending on the state of the child. Burica explained that this provides incentive for the child to, for example, take a bath in order to bring his or her temperature down - "so that Teddy can have a smiley green face again."

She envisions that health care professionals can say to a child: "This is your ally and your doctor, hold him by the paw."



Teddy the Guardian measures heart rate, oxygen saturation and body temperature through his paws.

Though they are still going through regulatory approvals in the US and have two clinical trials in July, Burica says Teddy the Guardian should be available in the UK next quarter.

From cute and cuddly to consumable, Andrew Thompson, of [Proteus](#), presented an ingestible sensor, which becomes activated upon ingestion and can be taken alongside medications.

This tiny sensor is able to give an individual an idea of how the medicines he or she is taking are working in the body.

"With no battery and no antenna, your stomach fluids complete the power source, and your body transmits the unique number generated by the sensor," the company website explains.

He explained that while the 20th century focused on "sick care," that is, curing sicknesses that have already developed, the 21st century is the age of "digital health," where health care centers become mobile phones, and experts become software programs.

What will the near future hold for medical technology?

The Wired Health event was certainly indicative of all the changes happening in the health care landscape at the moment, and it presented evidence in the abundance of start-ups trying to "dashboard" health data, whether individualized, global, DNA or behavior and lifestyle.

But at the moment, it feels like there is an onslaught of data-capturing devices for the consumer.

One lawyer attending the event mentioned that she felt overwhelmed by all of the choices available and was worried about whether, for example, the [Samsung Gear Fit](#) wristband would be able to sync up to all of the tech devices she would like for self-monitoring - now and in the future.

The question remains whether there will be a point when it all becomes streamlined, and one device in particular takes the reign, with apps becoming the main focus for start-ups. In this case, the Wired event next year could be markedly different.

But one thing is certain: the age of truly "knowing thyself" is at our fingertips.

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[Teddy the Guardian](#), accessed 30 April 2014.

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