The future of medicine lies in the use of information technology

2 May, 2014, 07.07AM IST

Post a Comment

By: Vivek Wadhwa, Director of Research, Duke University

In the TV series Star Trek, Captain Kirk has a handheld device called a tricorder that can immediately assess a patient's condition and diagnose disease. This is 300 years in the future.

In real life, technology is advancing so rapidly that within a decade, Kirk's tricorder will look primitive. Just as our bathroom scales give us instant readings of our weight, our smartphone tricorders will monitor our health and warn us when we are about to get sick. Our doctors—or their artificial intelligence replacements—will prescribe medicines or lifestyle changes based on our full medical history and genetic composition.

This future isn't being created just in Hollywood or Silicon in Valley; Indian entrepreneurs too are leading the charge.

Forus Health, for example, has built 3nethra—an inexpensive device for the early detection of common eye ailments. Sofomo Embedded Solutions markets Lifeplot—a 12-Lead mobile electrocardiogram (ECG). Agatsa is developing Sanket—a pocket-sized ECG with a display which does not require any leads or wires. NextServices has created enki - a mobile electronic health record platform Our smartphones already contain a wide array of sensors, including an accelerometer that keeps track of our movement, a high-definition camera that can photograph external ailments and transmit them for analysis, and a global positioning system that knows where we have been.

All of these devices can feed data into our smartphones and cloud-based personal lockers—turning this into a medical device. Gujarat-based Azoi, for example, is launching an iPhone case that tracks blood oxygen level, blood pressure, ECG, respiration, temperature, and has an attachment for reading lung functions.

Public Health Foundation of India has already built India's first tricorder—an android based mobile system called the Swasthya Slate that can perform 33 diagnostics tests including blood pressure, sugar, hemoglobin, and ECG. It can also test for pregnancy, dengue, and malaria.

The device, which retails for Rs 34,500 has been tested and approved for use in eight districts in Jammu and Kashmir. It is more features than products I have seen in Silicon Valley.

When we get sick, we won't need to go—in high temperature and in severe pain—to our doctors' offices, only to wait in line with patients who have other diseases that we may catch. Our doctors will come to us over the Internet.

Telemedicine is already a fast-growing field, particularly in India's villages and remote parts of the world—where doctors assist people using SMS, two-way video, and email. We too will see our doctors using video technologies on smartphones and tablets. Our body sensors will provide them with better medical data than they have today.Then, our smartphones will evolve further and do part of the job of doctors.

The same type of AI technology that IBM Watson used to defeat champions on the TV show Jeopardy will monitor our health data, predict disease, and advise on how to improve our health.

Already, IBM Watson has learned about all the advances in oncology and is better at diagnosing cancer than are human doctors. Watson and its competitors will soon learn about every other field of medicine, and will provide us with better, and better-informed, advice than our doctors do. They will take a more holistic view of our bodies, lifestyles, and symptoms than our doctors can. They will, after all, have our full medical history from childhood, know where we have been, and keep track of our medical data on a minute-by-minute basis.

Most doctors still work from brief, unintelligible, hand-scribbled notes and try to make a judgment about what medicines to prescribe us in a 10- to 15-minute consultation; they treat symptoms of interest rather than the holistic self.

Then there is the most revolutionary technology of all: genomics.We learned how to sequence the genome about a decade ago, and

The device, which retails for Rs 34,500 has been tested and approved for use in eight districts in Jammu and Kashmir. It is more features than products I have seen in Silicon Valley.

ET SPECIAL: Save precious time tracking your investments

sequencing it cost billions of dollars. Today a full human genome sequence costs as little as $1,000.

At the rate at which prices are dropping, it will cost less within five years than a blood test does today. So it is now becoming affordable to compare one person's DNA with another's, learn what diseases those with similar genetics have had in common, and discover how effective different medications or other interventions were in treating them. In other words, we have become data and software.

Today, medicines are prescribed on a "one size fits all" basis. In the future, you can expect to see treatment for diseases on the basis of an individual's genomic information, full medical history, and lifestyle.

This is technology that I expect India's IT entrepreneurs to take a lead in developing. After all, medicine has become an information technology and that is what India excels at.

(The author is also a fellow at Stanford Law School. You can follow him on Twitter: @wadhwa and visit his website: www.wadhwa.com)