



THE DOCTOR DILEMMA

Medical technology is advancing in leaps and bounds and individuals are taking responsibility for their own health and wellbeing. Is the day coming when doctors will be obsolete?

IN 2012, VINOD KHOSLA, THE CO-FOUNDER OF SUN

Microsystems, set the medical community buzzing like angry bees when he predicted that the future of the medical industry would involve more robots than doctors. Khosla suggested that machines will replace 80 percent of doctors in a healthcare future that will be driven by entrepreneurs. And that they would do a better job.

Fast-forward two years and Khosla's prediction doesn't seem too far-fetched. The AliveCor Heart Monitor fits on mobile devices to track heart health, allowing at-risk individuals to record their own electrocardiogram and get an interpretation almost instantly; the Smart Blood Pressure Monitor does what it says on the box; Cellscope transforms devices into microscopes used to test for ear infections or retinitis, and for diabetics the iBGStar Blood Glucose Monitoring System allows blood glucose level checks and data management from mobile devices. Robotic-aided surgery is on the increase, too and, according to a number of research papers, it's more accurate than human surgeons operating alone. From remote surgery, where the human counterpart directs a robot from afar, to minimally invasive surgery and unmanned surgery, machines are taking over the operating theatre.

Some argue that these one-off applications look at only one aspect of overall health, but computer programmes designed to interpret complex situations have been around for a long time – the Deep Blue programme beat chess grandmaster Garry Kasparov as far back as 1997.

IBM has developed a computer programme called 'Watson', which beat human counterparts at *Jeopardy!* and is now being used as an aid to diagnose and calculate treatment regimes in cancer patients. By applying statistical algorithms to patient data and accessing the latest research and methodologies, Watson can predict which treatment will be effective for a patient. By ingesting more than 600,000 pieces of medical evidence, over two million pages from medical journals, and being capable of searching up to 1.5 million patient records for more information, the computer has a breadth of knowledge no human doctor can match. Watson's not alone, either.

While this kind of computer-aided medicine is becoming commonplace, what about the human dynamic? A computer doing what it does best – making a few technical calculations – is one thing, but surely human interaction is another? Perhaps not. In an article in the *London Telegraph*, 25 percent of National Health Service patients complained that their doctors discuss their conditions as if they weren't there, 20 percent reported they were not given enough information, and 25 percent felt there was no one they could talk to about their fears. Patients might prefer a health chat with an avatar – after all, computers are programmed to be empathetic, never have bad days, and can give clear, concise information.

What Khosla was really getting at is that machine-based reasoning breeds a level of objectivity unattainable by people. Data goes in and results come out. A machine learning-based healthcare system could be cheaper, more accurate, more objective, and contain more diagnostic information than a human doctor. Computers dispense rational objectivity and that has the potential to make medical practice better.

In the end though, medicine is about helping people, and every person is a unique bundle of attributes with different communication methods. Can a machine reassure a patient? Medicine is about more than inputting symptoms and receiving a diagnosis; it's about trial and error, care and compassion, and empathy and understanding. Automation has its plus-points, but it could vanquish the concept of fighting on and beating the odds, ultimately defeating the indomitable human spirit – and humanity would be poorer for it.

There's no doubt doctors will increase their reliance on technology and there'll be a transition to automation; it's already happening. Perhaps this will lead to fewer doctors, but it may also give physicians more time to talk to patients, to provide empathetic care, and to discover the harder-to-measure pieces of information while the computer makes its cold-hearted objective analysis. It's more likely to be a joint effort between human and machine that will result in a higher level of medical care in the future. 🤖

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