TECHTALK

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2020 Vision

How information technology will give patients unprecedented control over their futures.

What will healthcare technology be like in the year 2020? Here are a few glimpses of a future I see as I gaze into my crystal ball. First of all, the good news is that the strategic application of information technology will rescue Medicare from catastrophic collapse, and will stretch the program to serve an increasingly older population. But, in the process, yet another revolution in healthcare delivery will ensue—a revolution that will force us to redefine the role of every caregiver, every healthcare institution, and even what we mean by a healthcare delivery system. It will also force us to rethink anew the entire notion of how clinicians work together, how patient information is gathered, and most specifically what the role of the patient is in all this.

The platitudinous "we are each our own most important caregiver" may well finally come true. Each of us will be equipped with a sort of Personal Digital Health Assistant—a multimedia-equipped computer-like device that has access to a prodigious database of medical knowledge, knows our complete medical history, and can coolly spew out all sort of differential diagnoses and advice based on reports of our symptoms and complaints.

Furthermore, its advice will be based on our current clinical signs, gathered from the feedback supplied by micro-miniaturized real-time health assessment monitors implanted in each of us. These monitors will constantly track and emit a constant stream of information about our vital signs, our cardiac rhythm, our brain waves, our blood chemistry, our blood gases, and lord only knows what else.

This information stream could be warehoused in a sort of "black box," analogous in a way to an airliner's device. When not used for medical intervention, such clinical data could be mined by medical researchers around the world as they search for the next miracle cure.

Sound farfetched? Consider what has already been developed.

The University of California, San Francisco, for example, has had for years a computer program called RECONSIDER which does an admirable job of proposing differential diagnoses based on patient complaints and signs. It even compiles a probability associated with each diagnosis. I worked on this program as a grad student there years ago with very primitive technology compared to what is available today. Then, as its name implies, it was considered a tool for the diagnosticians might overlook an obscure diagnosis. Now, its implications might be much more profound.

We've also developed a technology called neural networks, an amazing exercise in artificial intelligence, which extracts patterns out of seemingly pattern-less data. In a sense, these programs are attributed with the ability to learn. Currently, this technology is used to do program-trading on Wall Street and to breed cows in Australia, among other things! But tomorrow it could be used to spot a hypochondriac at 10 kilometers.

As for micro-miniaturization, we have a number of institutions developing molecular-sized robots and all sorts of other crazy technological wonders which come in amazingly small packages.

As for health monitoring technology, the Japanese already have developed a toilet which does a pretty thorough health assessment with your each and every flush!

As for interview and branching-logic techniques, aren't more and more people turning to TurboTax each year to settle their tax matters?

In the year 2020 I will manage most of my own health matters. I will consult with physicians when therapeutic intervention is required, when I suffer a major trauma, or when I suspect (or should I say when I am advised of the probability of) the onset of a major illness. Otherwise, I will be content to consult with my Personal Digital Health Assistant which knows me and has learned my foibles, which knows all my medical history, which has access to my current clinical indicators, and which presents me with a patiently presented interview process about each of my complaints and concerns.

Unresolved medico-sociological questions about all this abound, as today's healthcare infrastructure will continue to crumble. The French notion of hospital as Hôtel de Dieu (God's Hotel), that is, a place to die, will become obsolete. And just as the American notion of the medical house call is now only a pleasant memory, so too will today's medical consultation become an anachronism.

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