Editorial

Health and medical informatics in the 21st century: will the future be about EbM2C?

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It is always with a great deal of trepidation that this author sets out to predict the future. A review of his past prognostications does not generate a great deal of confidence in the reliability of his predictions: he seeks solace in knowing that he is not alone.

One hundred years ago, no one knew that $E=mc^2$. But, in the last century, our understanding of energy, space and time has given us a sophisticated knowledge of the cosmos. Similarly, in 1900, we had not grasped the mechanisms of heredity and we had absolutely no concept of the role of DNA. But by 1957, Watson and Crick had constructed a model of the double helix, opening up entirely new horizons for biochemistry and medicine.1

Thomas Watson, the chairman of IBM in 1943, has often been quoted as saying: ‘I think there is a world market for maybe five computers.’ In 1949, Popular Mechanics predicted that we might eventually have computers that weighed no more than 1.5 tons. In 1957, the editor in charge of business books for Prentice Hall was quoted as saying: ‘I have travelled the length and breadth of this country and talked with the best people, and I can assure you that data processing is a fad that won’t last out the year.’

We have come a remarkably long way in the last century, but there are so many new frontiers waiting to be explored. What will the men and women leaving our universities and colleges today discover, or create, and how will it affect our lives? That is where the mystery lies. That is what we cannot foresee – and history is full of examples that remind us of our limitations. As Maddox noted, we are no better equipped today to see the future than we have been in the past. We can only imagine the fields in which we might advance or, ‘imagine which areas are ripe for discovery.’2 When one hears the word ‘imagine’, images of Hewlett Packard’s early 1990s video about the way health care would be delivered in the 21st century come to mind.3

In guardedly trying to predict what role health and medical informatics will play in the 21st century, time could be spent discussing new technologies such as personalized medicine, regenerative medicine and telehealth/remote patient monitoring, which Goldsmith predicts will revolutionise hospital-based care.4 Similarly, one could discuss emerging technologies such as:

- virtual reality, as being used in the Personal Augmented Reality Immersive System (PARIS) project5
- the Genomic Messaging System (GMS), a language that allows patient clinical data to be embedded in a ‘smart’ DNA sequence; from there, it can be linked to applications for research and individualised clinical care
- ‘nose’ visual-tracking technology7 – an amalgam of ‘nose’ and ‘mouse’ – that shows great promise for hands-free computing
- ultrasensitive diagnostics such as four-dimensional elastic light-scattering fingerprinting (4D-ELF) to spot changes in cell architecture as small as a few nanometers, far tinier than can be seen with any microscope;8 4D-ELF has the potential to do for colon cancer what the Pap smear did for cervical cancer.

One could also attempt to forecast changes to healthcare delivery systems: changes such as primary care reform, chronic disease management, patient safety and errors, etc. However, with deference and apologies to Albert E., perhaps the safest predictor of the future will be to posit that it will be very much about $E_bM^2C$, that is, evidence-based medicine, evidence-based management, and evidence-based computing.

Evidence-based medicine will continue to play a critical part of our future, and much has been written about the role which health and clinical informatics will play in this arena. One example is the recent study by Magrabia et al, which reported that general practitioners will use an online evidence retrieval system in routine practice, and that its use improves the quality of patient care.9

Little has yet been written about evidence-based management: however, it is clear that the administrators and managers of health care are going to be increasingly expected to prove that they are practising
evidence-based management. The major sign of change is the accountability movement that has become a part of most healthcare systems around the world, as manifested by a number of ‘pay for performance’ initiatives in all health sectors, hospital ‘report cards’, more demanding accreditation requirements, and increasing consumer expectations.

Health and medical informatics will play a critical part, as accountability is very much about information. One can expect that there will be an increase in health care of the use of business intelligence, data warehousing and data mining tools that have become an integral part of managing private sector organisations.10

Finally, evidence-based computing (or informatics). This term is becoming more common and the concept is not unfamiliar to those who are following the progress of the English National Programme for IT: value-for-money arguments are rampant in the British press11,12. The best example is the Bend report, which argues that:

The absence of a coherent body of evidence demonstrating that effective use of ICT [information and communications technologies] in health can deliver real public value presents serious problems ... it hampers public and political debate on the use of ICT, potentially preventing appropriate spending on ICT in the future.p13

In other countries, we are reminded that while the use of ICT in health care has the potential for significant improvements, the challenge has been to reliably and consistently translate potential benefits into tangible and realised benefits.14

A few years ago, Sackett et al wrote:

Evidence-based medicine is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients.15

Will managers and health/medical informaticians not be held to similar standards?

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