

By Gerd Winter

Toward a healthy future... bit by byte

It is a revolution in health, no doubt, but one that is still evolving. eHealth is an umbrella term that describes a complex array of services and approaches (see fact box) with enormous potential. However, there are also big challenges.

According to Professor Bruce Barraclough, eHealth medical director of the CSIRO ICT Centre, eHealth applications will become particularly relevant as, in the context of an aging population, the focus of care is shifting from acute care to chronic disease management of conditions such as diabetes. Even some forms of cancer will in future be regarded as a chronic disease, which require a continuum of care, adding pressure on strained health care systems. The vision is that eHealth will facilitate a better understanding of the vast amount of information that is out there and allow a better handle on medical history and personal risk factors. This will allow more appropriate individual therapeutic management options and a more efficient use of available resources.

eHealth is...

It's been a buzz word for more than a decade but there is no all-encompassing definition. The WHO defines it broadly as the combined use of electronic communication and information technology in the health sector. Depending on your perspective, it can be seen as more consumer centred or more health provider centred. eHealth researchers, for example, frequently include cybermedicine, a consumer centred global exchange of information on the Internet. Governments and medical bodies, however tend to use eHealth as a term restricted to ICT based provider applications such as real-time video conferencing, electronic health records, remote disease monitoring and other modalities.

Electronic Medical Records (EMR) and **Electronic Health Records (EHR)** are proclaimed centrepieces of government eHealth strategies around the world. Frequently used synonymously by government and health professionals, they may describe very different things.

The EMR is a record of a patient created and legally owned by individual care providers. It is source data for EHRs, which the Canadian Health Infoway describes as "a secure and private lifetime record of an individual's health and care history, available electronically to authorized health providers. It facilitates the sharing of data –across the continuum of care, across healthcare delivery organizations and across geographies." EHRs are reliant on EMRs being in place, and EMRs will never reach their full potential without a comprehensive and interoperable EHR system.

The holy grail of eHealth: electronic health records....

For this vision to be realised, governments around the world believe that there needs to be a comprehensive electronic health record (EHR) system in place (see box). Currently, information on a person's medical history is usually dispersed over a multitude of filing cabinets and personal computers of individual care providers. With EHRs key clinical data could become instantly accessible and shared by a team of care givers. However, while the vision is clear, the implementation of such a system has proved to be challenging for any health care system. Australia is no exception.

"In a country [like Australia] that has a federal system with individual jurisdictions, budgets and needs, the task should not to be underestimated," says Barraclough.

Canada, although similarly fragmented in its health care system, has progressed further and is on track to implement a 'baseline EHR' for every Canadian by 2015, collating core patient information, diagnostic imaging, laboratory, medication, hospital/clinical reports and immunization data. Barraclough puts this down to a strong leadership able to link a vast array of systems across the number of provinces, but which could also draw on a

budget of more than a billion dollars.

However, there is no off-the-shelf answer, he says, and in Australia a lot more work and coordination is needed. This is also a leadership issue, in particular after Dr Ian Reinecke's resignation as chief executive officer of the National Health Transition Authority (NEHTA), the body that is to oversee the implementation of EHRs in Australia.

The chief executive officer of the Australian eHealth Research Centre, Garry Morgan, believes that a strong leadership is needed that understands the legal, social and technology aspects but also has a sense for business and commercial issues. Australia's health system is governed by complex financing agreements involving multiple layers. In this context, Morgan says, there is currently no sustainable business model in place. Who is going to build a sustainable business model and who is going to implement it and is making money out of it? Or is the Commonwealth going to provide it for all Australians? These are questions nobody has an answer for at the moment, says Morgan.

Another hurdle in the Australian system is that each patient has to give consent to have his data included in an eHealth record, and, Morgan says, it may require an education campaign so patients become aware of the relevance to consent to the usage of their data for the benefit of their own health outcomes.

Faced with similar challenges, the British NHS is now introducing two types of online health records, the Summary Care Record, a centrally stored summary of patient information generated from provider EMRs, and 'HealthSpace', which people can use to create their own record. The Summary Care Record will be generated for everyone without patient consent asked for. Individuals that do not wish to participate need to actively opt-out, a model much criticised by the British Medical Association.

HealthSpace on the other hand, is to provide a more consumer centred documentation of health, recognising a trend towards an increasingly self-empowered health consumer. However, commercial IT organisations, such as Google and Microsoft, have already commenced similar health spaces, which consumers are entirely in control of, and in a recent editorial in the British Medical Journal Professor Michael Kidd, a leading Australian expert in eHealth, comments: "Given the choice of having governments create and exert a degree of control over your internet based personal health record, and being able to do it yourself with a little help from Microsoft or Google, which would you choose?"

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...people's choice? – the personal health record

The Australia 2020 Summit recommendation to: "Create a 'Healthbook' (like Facebook) for Australians to take greater ownership of their health information.." shares a similar sentiment. There is no need to wait for Google or Microsoft, though, which as large and diverted organisations, are also plagued with concerns over privacy issues.

A consumer driven complementary model to the EHR, the personal



Screenshot of a miVitals account page. On the left, there are various core modules covering health issues relevant for the average account holder (e.g. Emergency, Preventative Health, Immunisations). Added modules (bottom left) will in future address specific conditions such as diabetes or asthma. Within each module account holders can add records guided by prompts.

health record (PHC), is already up and running. An Australian startup, miVitals, is offering a secure personal online health record system which allows consumers to store and manage their health and lifestyle.

With miVitals the consumer is the captain in his boat but he is not left without advice on how to steer it. Individual records are organised around modules covering relevant health aspects, such as emergency information, allergies, preventative health measures etc, whereby each of these modules feature prompts guiding the account holder on what information on health and lifestyle issues they should record to best assist their health professionals.

According to Jude Forrest, chief executive officer and founder of miVitals, these prompts were developed in extensive consultation with health professionals and with contributions from an international advisory board to ensure they were informed by best practice.

The site also allows primary account holders to manage a group of individuals such as dependent children, with separated records of members organised within one account.

Forrest says that miVitals is unique in being “totally consumer driven yet professional friendly” adding that the site will also allow a level of integration into a future EHR strategy.

miVitals reflects a global shift in how health care is delivered, says Forrest, with people being more engaged in a partnership involving an increasing number of professionals. People are also more mobile. “It just makes sense for people to have access to their information wherever they are and 24/7,” Forrest says.

She is aware of the imminent competition by Google and Microsoft but says miVitals has first mover advantage in the Australian market after having completed trials in 2007. And importantly, personal health records are miVitals core business, whereas Microsoft and Google are across many markets and health is only one area of focus.

MiVitals has gained support from various consumer advocacy groups, such as the Asthma Foundation and Epilepsy Australia, and is in the process of developing specialist modules for patients with chronic diseases such as diabetes and asthma. Consequently, Forrest expects the chronically ill to be an important user group. Another is expected to be families with young children. However, since it was launched in January 2008, miVitals has attracted users aged from 20 to 75 located in over 40 countries,

indicating that the site appeals to people across all age groups.

The general reaction from health practitioners is positive, she says, because they can see the benefits. Once the system is fully developed, patients can share data on their health and lifestyle with their practitioner but have control over what kind of information they want to disclose.

In turn, health professionals can easily upload files they want to share with the patient.

Spelling out her vision of the future, Forrest says ten years from now people will access their health information, wherever they are in the world, with their mobile phone by accessing PHCs such as miVitals, and instantly share selected data with a care provider at the point-of-care.

Staying home: the telecare option

Telecare is another area of eHealth promoting a more self-reliant and empowered patient. Nigel Lovell, Professor at the UNSW Graduate School of Biomedical Engineering, who is also involved in the acclaimed Bionic eye project, believes telecare options for the elderly and chronically ill in their home setting will have a greater overall impact. Lovell is director of the Australian startup company TeleMedCare, which provides home telecare systems designed for routine scheduled monitoring of people with chronic diseases. The TeleMedCare service records various standard clinical indicators of a patient’s health such as ECG, blood pressure, lung function etc within their home environment, and creates longitudinal datasets that can be monitored by health professionals.

“This is not rocket science technology, it is integrative technology

“Once patients start to understand a certain behaviour affects their health status and they can see that on a graph over time, they feel more empowered and in control,” says Professor Nigel Lovell

very well thought through and targeted towards the root causes of the problem,” says Lovell. The monitoring technology is well in place but they are now intensively working on sophisticated decision support systems that help health professionals to extract knowledge from the large amount of collected data.

Are there compliance issues? Lovell says that at least their trials did not suggest problems with patient compliance. “Once patients start to understand a certain behaviour affects their health status and they can see that on a graph over time, they feel more empowered and in control.” The depersonalisation of the doctor-patient relationship could be an issue and needs to be addressed. However, he says that in their experience tele-monitoring actually brings patients closer to the doctor, because they feel continuously cared for. The technology is not replacing the doctor-patient interaction but complements it.

There are barriers in the acceptance of such technology, Lovell says, although there is good evidence that when correctly implemented and within specific target groups, such as in the follow-up of patients with congestive heart failure, the cost savings are considerable, simply as the number of costly hospital admissions can be reduced.

To his own surprise, Australia is leading the world in this area. There was a very strong technology base to begin with but also an early understanding of how the technology integrates into existing health services, also in the context of rural and remote populations. This has been adapted now to other systems, the UK, New Zealand, and South East Asia.

However, this position has to be secured as the world is catching up...