



Mobile health apps: why they are such a big deal

With the uptake of mobile health expected to accelerate over the next few years, Amanda Maxwell speaks to Simon Wickes of Roke Manor Research to find out what challenges there are for the successful implementation of these technologies and what is being done to address these issues

Simon Wickes has had the kind of career that most human science research graduates would only dream of and a resumé that puts him in the right place at the right time.

While working for the UK Ministry of Defence (MoD) for over a decade, he was on a NATO panel investigating injury prevention for UK military aircrew.

Since then, he has led a team that was training UK Olympic gold medallist James Cracknell for the well-publicised Marathon Des Sables, assessing in real-time his responses during the race.

Now, in his current position as business sector manager for

healthcare at electronics engineering company Roke Manor Research, Mr Wickes is channelling his experience, combined with his background in maths and sports science, into the cutting edge of medtech and throwing himself wholeheartedly into the communication of healthcare data.

This is an exciting cutting-edge field to be in, Mr Wickes told *Clinica* in an interview in central London, adding that much of the new technology on which he is working involves patient monitoring, electronic sensors and wireless communication, all of which have been central features of his career to date.

When it comes to the communication of healthcare data, there are also key questions surrounding network security and analysis of small and large data, but nothing there to phase someone who have spent twelve years working with the MoD.

Indeed, when it comes to data protection, Mr Wickes also has the support of the wider Roke company whose mission is to “solve technically challenging problems and deliver innovative capability and products into the defence, national security and, telecommunications,” as well as healthcare, markets.

Mr Wickes is also a key contributor in this field at national level; as well as being involved in defining an mobile health (m-health) strategy at Roke, he is also active in the UK Technology Strategy Board’s Dallas Partnership, which aims to “Deliver Assisted Living Lifestyles At Scale,” a UK-wide initiative with a £23m investment.

The programme will establish 3-5 communities of at least 10,000 people each to show how assisted living technologies and services can be used to promote well-being and provide top quality health and care available at a sufficient scale and cost to enable independent living.

Can existing infrastructure cope with m-health deluge?

During our interview, we looked out over the river to London’s Big Ben, the clock tower on the Houses of Parliament, a sharp reminder of the weighty decision-making concerning spending cuts which the government – not just in the UK but all over the world – is facing at this time of economic crisis.

It therefore seemed apt to be speaking about the type of technological developments that will make it possible to monitor patients at home through m-health and are considered to be the answer to providing sustainable care in financially straitened conditions.

M-health and e-health have had a high profile in *Clinica’s* pages of late, but one aspect that occupies much of Mr Wickes’ time, an issue common to all developing and employing these technologies, is the challenge faced by existing cellular and WiFi networks.

How will the current network

infrastructure cope with the potential vast volumes of data sent electronically once these technologies becomes commonplace and used by a large percentage of the population?

How will the situation pan out, for example, when it becomes commonplace for images from CT scanners and MRI systems to be beamed all over the world through cellular networks to doctor’s smartphones for analysis?

Much data will need to be streamed through mobile technology from each patient to the healthcare services that are monitoring their conditions, as with a diabetic, for example, whose blood sugar levels are being recorded for sending and analysis, or a patient whose heart condition needs monitoring.

Much of the patient data being streamed will not be of an urgent nature and so immediacy of data transfer will not be an issue. However, there needs to be a function to ensure that medical urgent data does get through the network with immediacy so that urgent action can be taken.

This would be the case, for example, if a diabetic patient being monitored becomes hypoglycaemic, or that a heart condition patient shows cardiac warning signs.

These considerations need to be looked at in the context of potential data transfer services, Mr Wickes explained.

Cellular bandwidths are finite and the growing trend towards providing in-home assisted living for patients with chronic conditions and the use of network-enabled medical scanning technology will place additional strain on the network, resulting in reduced reliability, especially where video content is involved.

For this reason, Mr Wickes foresees that devices will need to be developed so that they have data prioritisation switches and smart apps that control dataflow to times that meet the level of priority of the data and the network bandwidth. Roke, it seems, are already addressing this problem with their award-nominated SmartSwitch product.

The growing demands may also mean that wireless carriers charge fees for particular application-based bandwidths, he warned, and at premium costs. Already there is talk of advanced billing plans for wireless

carriers to meet the costs of increasing their infrastructure to cope with the new m-health revolution.

Reserving bandwidths for emergency services, such as the armed forces and the ambulance services is already something that occurs and which could be further extended, he explained.

Indeed, all of these applications in the field have parallels to healthcare in the battlefield, Mr Wickes said.

Network black spots is another challenge to overcome, with the need for more mobile base stations to ensure consistent coverage in all areas, including the more remote, so that m-health solutions can be used across the country

What is learnt in one environment is useful in another, and just as Mr Wickes is able to put his MoD and health monitoring experiences to good use in the mobile health technology field, so is his experience in healthcare data communications relevant for the battlefield. The sooner the condition of a casualty can be accurately assessed, diagnosed and communicated to the destination hospital, the better the survival or quality of life chances for that casualty.

Regulatory questions

Mr Wickes recognises that we are still at a stage of relative infancy when it comes to the regulation of the technology needed to support patients to look after themselves in their own homes, or the technology needed to communicate medical data electronically.

He welcomed the clear delineation made by the US FDA, in its recently issued draft guideline on mobile apps (www.clinica.co.uk, 21 July 2011), between apps which are intended for well-being, for example the Nike app which measures the distance and speed you have run, and those that are for medical decision-making, such as a symptom tracker which leads to treatment.

But he recognised that there will be many grey areas and that where apps are considered for well-being that consumers will still value their endorsement by public bodies, such as the National Health Service in the UK, to inspire confidence in the service they provide.

"Any regulation will stifle innovation," he warned, questioning the costs and time that it will take to develop regulated medical apps, given the need for clinical testing and approval processes.

He also highlighted, just as did the US Society of Quality Assurance (www.clinica.co.uk, 7 November 2011), the fact that many app creators will not realise that the products they are creating are, in fact, within the scope of medical device regulations.

Moreover, there is a risk, he said, that such regulations will threaten the ability of small entrepreneurs, of which there are many in this field, to survive. Many already developing small plug-and-play devices, such as ultrasound probes that can plug into smartphones to create images on the phone.

Data security – a "minefield"

The unknown factor, we both agreed, was the degree to which the ongoing review of the medical device

directives will touch specifically on the questions of mobile apps and network security.

It seems that the current scope of the directives would already encompass these products because of their intended action, but that more specific regulatory issues may be left to guidance documents, and that the EU may well closely follow the US FDA, once its guideline has been polished and adopted.

But data security during transmission and tenure within smartphones and other personal as well as private databases, is yet another concern. This is particularly the case as the population in general is "very lax on the whole" about data security, Mr Wickes noted, citing the use of social networking sites that contain personally sensitive data, and many people that may be involved in the use of such technology will be elderly and very sick.

Will it become normal to have apps

on smartphones and other home/field technology that can encrypt and transmit medical data? And how and where should data capture, communication, analysis and reaction be regulated?

Who should be responsible for encryption standards?

Just imagine the risky situation of a diabetic president whose medication was being controlled centrally and whose data being communicated electronically.

The questions seem futuristic in nature, both exciting and scary. There is no question that the type of experts needed to drive this field are those who understand the importance of data security, of potential threat, and who understand the importance of monitoring patients in difficult situations.

Mr Wickes, it seems, has carved out, even if by happy coincidence, a field where his expertise will be much in demand.

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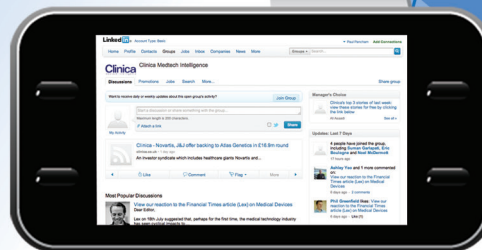
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