Monitoring and caring for patients in their homes through advanced ICT is on the increase, but there is still a lot to learn, writes Robert Kelly

A 2006 EUROPEAN COMMISSION REPORT has suggested: “the way healthcare is presently delivered has to be deeply reformed. The situation is becoming unsustainable and will only worsen in the future as chronic diseases and the demographic change place additional strains on healthcare systems around Europe.” 1 The report calls for a new way of delivering healthcare based on preventative and person-centred health systems. This new model could only be achieved through the proper use of information and communication technologies (ICT). 1

It is thought that 80% of GP admissions to acute hospital care are related to chronic disease; and that patients with a chronic disease or complications use over 60% of hospital beds. What is termed ‘telehealth’ and ‘telecare’ have been proposed to assist these patients by providing remote monitoring of conditions in the patients’ homes, such that preventative measures can be taken where appropriate, while also facilitating earlier hospital discharge with subsequent home monitoring. 2 A national survey in Ireland has shown that 25% of hospitals partake in some form of telehealth; however, the number of primary care centres that use telehealth is not known. 3

Growth in IT and the connection to healthcare

In recent years there has been a rapid growth in ICT, from the advances in mobile phone technology and delivery of broadband and internet services, to innovations such as Skype and digital television. Each of these has the potential to connect users to technology that may be applied to healthcare. ‘Connected health’ seeks to use messaging and monitoring technologies to bring care to where the patient is and when the patient needs it. Multiple studies are on-going in Ireland in this area.

The challenge for the medical community is to openly embrace the opportunities for patient care with these technologies and to consider using some of them. Innovation in healthcare along with cost-reducing technologies and innovative business models can deliver increasingly affordable and accessible healthcare (so called ‘disruptive innovation’) for patients. 4 Great examples of this include using the internet or mobile phones to deliver education to patients to manage and prevent disease, eg:

- www.patientlikemecom – a website for patients who wish to discuss their conditions with other patients or specialists
- iheed.org – a web-based innovation by Cork GP Dr Tom O’Callaghan to provide digital-based health education on mobile phones for healthcare workers
- Simulconsult.com and WebMD.com – medical specialty web-based consult services.

Disruptive innovation and telehealth in Ireland

Preventing and managing cardiac disease and its consequences provide an enormous opportunity for disruptive innovation. As an interventional cardiologist, I place stents in coronary arteries which in the past could only be treated with bypass surgery. In the near future however, medications and better preventative healthcare may mean that fewer patients require stents or surgery.

Many doctors use healthcare apps to educate patients about heart disease and risk factors. In fact, there are over 6,000 health, medical and fitness apps available for smartphones. GPs can access doctot.com for apps that help patient assessment.

Several cardiologists use the internet for patients to monitor their home blood pressure and then transmit data in a secure coded file to the doctor to advise on. It is convenient for the patient, costs less and is often quicker than having to wait for a consultation. Skype clinics facilitating virtual face-to-face consultations between doctors and their patients is another good example of how telehealth is being practised in Ireland.

Educating patients through cardiovascular telehealth translates to improvements in patient knowledge, compliance and future outcomes, and also means less need for follow-up visits to the GP.

To give an example of practical telehealth in Ireland, I am currently assessing elderly patients in the community with a novel bluetooth remote cardiac monitor, which relays data through the mobile phone network to my office where I can see what heart rhythm patients are experiencing.

This study is trying to detect atrial fibrillation in patients at risk of stroke. I am also co-investigator of a study to look at whether cardiac risk factor education by internet-based lifestyle coaching can improve outcomes among cardiac patients.

Evidence to support telehealth

There is clinical evidence to support improved care outcomes arising from telehealth aimed both at chronic conditions such as heart failure and more generally at supporting older people within the community. There is some evidence that telehealth can help to improve the quality of life and care outcomes of people with a wide range of different conditions. 5

A review of telehealth studies for chronic diseases by Paré et al concluded: “based on the results of this review, home telemonitoring (telehealth) of chronic diseases seems to be a promising patient management approach that produces accurate and reliable data, empowers patients, influences
their attitudes and behaviours, and potentially improves their medical conditions. Bensink et al have commented that the evidence supporting the application of home telehealth to a number of diseases/conditions is growing. Evidence exists for the clinical effectiveness of home telehealth in diabetes, the general area of mental health, high-risk pregnancy monitoring, heart failure and cardiac disease.

In a 2007 systematic review specifically for chronic heart failure (CHF), Clark et al concluded that telehealth provision could result in a 20% reduction in mortality, while 50% (three out of six) of the RCTs reviewed reported statistically significant improved patient quality of life.

Furthermore, home monitoring of heart failure patients has been shown to have a positive impact on the clinical process, supported by a significant improvement of patient follow-up by adjustment of treatment, diet or behaviour, as well as hospital readmissions and emergency visits reduction. It has also had a positive impact on the patient’s health, supported by a relevant improvement in quality of life, a reduction of days in hospital, and a decrease in mortality; and on costs, resulting from the use of health resources.

Hersh et al suggest there is strong evidence for telehealth in only a handful of clinical specialties, highlighting asthma, CHF, hypertension and pulmonary disease. They do however, point out that this does not mean that telehealth is not effective, but rather that the quality of studies assessing it is not sufficient to draw conclusions.

**Telehealth and the future**

There are many challenges to implementing telehealth in the community, including financial, organisational and government sponsorship. There are also other challenges, such as clinician involvement, overcoming cultural barriers to change, training and support to develop skills and competencies, patient data protection as well as significant technical skills to be considered.

Many believe new ways of delivering healthcare are required and that telecare and telehealth could have prominent roles. Yet both are relatively new and it will be some time before their true potential can be realised.

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