How digital tools are revolutionising patient care

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New electronic devices are being used by people of all ages to track activity, measure sleep and record nutrition. Credit: Shutterstock

Imagine you've recently had a heart attack.

You're a lucky survivor. You've received high-quality care from nurses and doctors whilst in hospital and you're now preparing to go home with the support of your family.

The doctors have made it clear that the situation is grim. It's a case of: change your lifestyle or die. You've got to stop smoking, increase your physical activity, eat a healthy balanced diet (whilst reducing your salt), and make sure you take all your medicine as prescribed.

But before you leave the hospital, the cardiology nurse wants to talk to you. There are a few apps you can download on your smartphone that will help you manage your recovery, including the transition from hospital to home and all the health -related behavioural changes necessary to reduce the risk of another heart attack.

Rapid advancements in digital technologies are revolutionising healthcare. The benefits are numerous, but the rate of development is difficult to keep up with. And that's creating challenges for both healthcare professionals and patients.

What are digital therapeutics?

Digital therapeutics can be defined as any intervention that is digitally delivered and has a therapeutic effect on a patient. They can be used to treat medical conditions in a similar way to drugs or surgery.

Current examples of digital therapeutics include apps for managing medications and cardiovascular health, apps to support mental health and well being, or augmented and virtual reality tools for patient education.

Paper-based letters, health records, prescription charts and education pamphlets are outdated. We can now send emails, enter information into electronic databases and access electronic medication charts.

And patient education is no longer a static, one-way communication. The digital revolution facilitates dynamic and personalised education, and a two-way interaction between patient and therapist.

How do digital therapeutics help?

Digital health care improves overall quality of care, even in cases where a patient lives hundreds of kilometres away from their doctor.

Take diabetes for example. This condition affects 1.7 million Australians. It's a major risk factor for developing cardiovascular disease and stroke. So it's important that people with diabetes manage their condition to reduce their risk.

A recent study evaluated a team-based online game, which was delivered by an app to provide

diabetes self-management education. The participants who received the app in this trial had meaningful and sustained improvements in their diabetes, as measured by their HbA1c (blood glucose levels).

App based games of this kind hold promise to improve chronic disease outcomes at scale.

New electronic devices are also being used by people of all ages to track activity, measure sleep and record nutrition. This information provides instant and accurate feedback to individuals and their therapists, allowing for adjustments where necessary. The logged information can also be combined into large data sets to reveal patterns over time and inform future treatments.

Digital therapeutics are spawning a new language within the healthcare industry. "Connected health" reflects the increasingly digital ways clinicians and patients communicate. A few examples include text messaging, telehealth, and video consultations with health professionals.

There is increasing evidence that digitally delivered care (including apps and text message based interventions) can be good for your health and can help you manage chronic conditions, such as diabetes and cardiovascular disease.

But not all health apps are the same

Whilst the digital health revolution is exciting, results of research studies should be carefully interpreted by patients and providers.

Innovation has led to 325,000 mobile health apps available in 2017. This raises significant governance issues relating to patient safety (including data protection) when using digital therapeutics.

A recent review identified that most studies have a relatively short duration of intervention and only reflect short-term follow up with participants. The long-term effect of these new therapeutic interventions remains largely unknown.

The current speed of technological development means the usual safety mechanisms face new ethical and regulatory challenges. Who is doing the prescribing? Who is responsible for the efficacy, storage and accuracy of data? How are these technologies being integrated into existing care systems?

Digital health needs a collaborative approach

Digital health presents seismic disruption to patient care, particularly when new technologies are cheap and readily accessible to patients who might lack the insight required to recognise normality or cause for alarm. Technology can be enabling and empowering for self management, however there's a lot more needs to be done to link these new technologies into the current health system.

Take the new Apple Watch functionality of heart rate notifications for example. Research like the Apple Heart Study suggests this exciting innovation could lead to significantly improved detection rates of heart rhythm disorders, and enhanced stroke prevention efforts.

But when a patient receives a high heart rate notification, what should they do? Ignore it? Go to a GP? Head straight to the emergency department? And, what is the flow on impact on the health system?

Many of these questions remain unanswered suggesting there is an urgent need for research that examines how technology is implemented into existing healthcare systems.

If we are to produce useful digital therapeutics for real-world problems, then it is critical that the end-users are engaged in the process. Patients and healthcare professionals will need to work with software developers to design applications that meet the complex healthcare needs of patients.

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