MOBILE HEALTH IN CHRONIC DISEASE MANAGEMENT

Text by Dr Yau Teng Yan

When I first entered medical school almost 15 years ago, no one had heard of the word "smartphone". Our mobile phones (if we were lucky to own one) were clunky devices with a screen that was just useful enough to play "Snake" – definitely not something you'd call smart. In the same year I began my housemanship, the world's first iPhone was launched. At that time, many people thought it'd be a big flop – it was way more expensive than other phones in the market (think Nokia and Blackberry). Plus, it didn't even have a keyboard!

Fast forward to today – more than 88% of adults in Singapore own a smartphone, according to a survey conducted this year.[1] In fact, Singapore has the highest smartphone penetration rate in Asia. It is thus inevitable that everyone will be using smartphones to guide our lives, from news to communication to social connections and health. Today, our patients consume and digest health information in ways that weren't available just a decade ago.

The current health trend

Mobile health (mHealth) is defined by the World Health Organization as "the provision of health services and information via mobile technologies such as mobile phones". This lends itself to a compelling case for the use of mobile health in chronic disease management, where patient education and engagement is highly essential for good clinical outcomes.

Let's take for example the case of diabetes. Globally, there are approximately 415 million people living with diabetes and the numbers are rising year after year. Singapore has the second-highest proportion of people with diabetes among developed nations, at 10.5% of people aged between 20 and 79 years, according to a report from the International Diabetes Federation.[2] An equally worrying trend is that, among Singapore patients, three in ten have diabetes before turning 40. It is clear that we have a big problem on our hands and it also suggests that the current way we practise healthcare may not be good enough.

Diabetes is a very data-driven disease. Our patients need to make daily decisions around their food intake, their physical activity, how much insulin to inject, and many more. Their glucose levels are impacted by all these factors, including the less tangible ones like stress, mood and sleep. One of the promises of mHealth is that if we can capture all this data in a digital format, we will be able to layer on analytics that can provide a patient with personalised and actionable insights to better manage his/her condition.

mHealth has the potential to encourage behaviour change by triggering patients to adopt new behaviours at the right time. For example, patients with diabetes often record their glucose readings in a paper logbook, which they bring to their doctor during their three- to six-monthly clinic reviews. If that information is synthesised and presented back to the patient in a timely manner, such as through reports or direct feedback, he/she would be able to take steps to correct it even before the clinic visit.

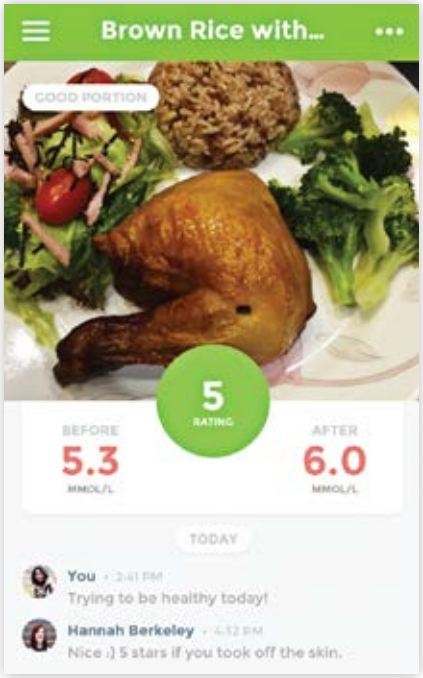
Dr Yau Teng Yan is a digital health advocate and self-professed techie. He believes that one day, technology will finally fulfil its promise of making our lives as medical practitioners easier, so that we can spend more of our time on what matters most – our patients.

Apps in the market

Here are a few apps that your patients with diabetes may be using:

mySugr logbook (https://mysugr.com) is a popular app that allows patients to record all their diabetes data, including glucose, food, exercise, insulin and medications, in one place. It has a colourful and playful interface, in line with its goal of "making diabetes suck less". They can set reminders, for example for a post-meal glucose check or to take medications. There are also daily challenges to complete, such as "Vampire", where you get points for checking your glucose levels seven times within 24 hours. These features make it particularly appealing to those who use insulin as part of their diabetes treatment.

GlycoLeap (https://glycoleap.com) is a smart coach for people with prediabetes and type 2 diabetes. It supports them in developing better lifestyle habits to keep their glucose levels and weight in control. A unique feature is that patients get access to a real-life health coach through the app, who guides and motivates them to eat better and be more active. This is done via photo logging and text messaging. Patients also get access to interactive online diabetes self-management lessons on nutrition, exercise, monitoring, medications and stress management.



Last but not least, there is the **Healthy 365** app (www.healthhub.sg/apps/25/healthy365) by the Health Promotion Board. While it is not an app specific for diabetes management, patients can use it to track their daily step count, food and drink intake, and calories consumed. It has a food

database with over 1,000 local dishes and drinks. This app is used for the National Steps Challenge which incentivises patients to be active through rewards like vouchers based on their step counts.

The downside

There are several caveats to mHealth, of course. As it is a relatively new field, more scientific research needs to be conducted. There have been several pilot studies on mHealth interventions that are very encouraging. However, larger randomised controlled trials of longer durations are needed to establish the evidence for the safety, efficacy and cost-effectiveness of these tools. This allows us to separate the wheat from the chaff among the thousands of apps and programmes available, and use the tools that actually work. I believe this will happen with time.

Also, most of the apps todays are in English and require basic knowledge of how to use a smartphone. Hence, they may not be useful for the elderly who are not tech-savvy and patients who do not speak English, are physically challenged, and/or with a lower socio-economic status. There are also some tricky issues that need to be worked through, such as who owns the health data: the patient or the software developer? Additionally, digital tools may be hacked by cyber attackers, which could result in inadvertent exposure of private health data.

Conclusion

mHealth can be a powerful tool in our arsenal as we strive to move upstream and keep our patients healthy and well. The next-generation doctor will be someone who is in touch with technology and is able to leverage on new tools in the right circumstances for the benefit of their patients. I'll end off with a quote from Dr Mike Evans, an associate professor of Family and Community Medicine at the University of Toronto: "In the future, I'll prescribe you an app. One of our whiteboards will drop in and explain what high blood pressure is. The phone will be bluetoothed to the cap of your pills. I'll nudge you towards a low salt diet. All of these things will all happen in your phone. I see you two or three days a year. The phone sees you every day." ◆

References

1. We are Social. Special reports: digital in 2016. Available at: http://wearesocial.com/sg/special-reports/digital-2016.

2. International Diabetes Federation. IDF diabetes atlas – 7th edition: across the globe. Available at: http://www.diabetesatlas.org/across-the-globe.html.

Note

a. Dr Yau Teng Yan guided the team in Singapore that created the GlycoLeap app.