

New technologies help people with heart disease

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People taking part in cardiac rehabilitation exercise programmes are likely to maintain healthy behaviours for longer with text message and web-based support, according to recent research from the University of Auckland.

Several trials led by Associate Professor Ralph Maddison from the University's School of Population Health, have shown that the additional support gave people the confidence and motivation to be more physically active, improved their quality of life, and was likely cost-effective as an on-going programme.

"Cardiac rehabilitation is a secondary prevention programme that offers education and support to assist patients with coronary heart disease to make lifestyle changes," says Dr Maddison.

"Despite the benefits of cardiac rehabilitation, attendance at centre-based sessions remains low", he says. "Remotely delivered interventions may offer patients another way to engage successfully in cardiac rehabilitation.

"They improve access for people needing cardiac support by giving people help to self-manage their rehabilitation."

The mobile technology (mHealth) has the potential to reach more patients by delivering cardiac rehabilitation directly to mobile phones, providing options for those unable to attend centre-based rehabilitation

programmes.

The first trial (HEART) evaluated if a mHealth exercise-based cardiac rehabilitation programme could improve people's [physical activity levels](#) and their exercise capacity (or fitness) - over and above usual cardiac rehabilitation services offered in New Zealand adults diagnosed with heart disease.

"The primary outcome of this trial was people's exercise capacity or physical fitness measured by oxygen uptake during a treadmill walking test," says Dr Maddison. "Secondary outcomes included physical activity levels, confidence and motivation to be active, health related quality of life and cost-effectiveness."

In the trial, half of the participants had a programme of text messaging and access to a website where they could set exercise goals and review their text messages. The text messages provided information about exercise prescription as well as giving people behaviour change strategies on how to engage in regular physical activity..

They were also given a pedometer and could record the number of steps each day when they logged onto the website. This website had links to information about other community-based programmes, as well as links to short videos of role models who talked about their exercise programme and the challenges they had overcome.

"Results showed that both groups increased their [exercise capacity](#) a small amount with no significant difference between the two groups," says Dr Maddison. "However there were significant increases in leisure time activity and walking for those on the intervention programme."

The intervention had a positive effect on confidence and motivation to exercise, as well as the physical domain of the Health Related Quality

measure. As an on-going programme, HEART was considered likely cost-effective for increasing leisure time activity and walking.

The study of exercise behaviour was published recently in the *European Journal of Preventative Cardiology*.

Building on the HEART trial, Dr Maddison and Mrs Pfaeffli-Dale have developed and evaluated a mHealth comprehensive cardiac rehabilitation programme for improving people's adherence to healthy lifestyle behaviours – such as being physically active, having a good fruit and vegetable intake, not smoking, and low alcohol consumption in New Zealand adults diagnosed with heart disease.

The Text4 Heart trial has recruited 120 participants with heart disease. Like HEART, the programme consists of text messaging and internet support aimed at encouraging positive changes for exercise, diet, smoking and alcohol consumption.

"The primary outcome of this trial is the proportion of participants adhering to healthy behaviours after six months - measured using a composite health behaviour score," says Dr Maddison. "Secondary outcomes include assessments of overall cardiovascular disease risk, body composition, illness perceptions, self-efficacy, hospital anxiety/depression and medication adherence."

Results from this trial are due in a few weeks.

Another trial just started called REMOTE (and funded by the Auckland Medical Research Foundation) does not involve text messaging, but instead allows people to exercise at home or in their community while being monitored remotely and in real time.

Participants in the intervention receive a package of technology

including a chest sensor band that records heart rate, ECG, breathing rate and uses GPS for recording movement and acceleration.

The device talks to a mobile phone App, sending back information via a middleware platform, so that the researchers can view the data from anywhere in New Zealand in real time. This web based app can monitor up to 12 people at a time.

"Participants do this three times a week with them logging on at a set time and doing their exercise prescription under the watch of a remote exercise scientist, who lets them know how much to do each day," says Dr Maddison.

The exercise scientist sets their [exercise prescription](#) and monitors them during their exercise session. Using the technology, the exercise scientist reviews their progress and provides feedback and support to exercise on a regular basis. Participants can also set goals and review their own progress.

"We are comparing the results of this 12-week programme to a standard supervised [exercise](#)-based cardiac rehabilitation programme, and we want to see if it is as good as but no worse than current care."

"Collectively, this research aims to provide people with [heart disease](#) another option, particularly for those who cannot access traditional cardiac rehabilitation because of work or family commitments or they live at a distance from a hospital-based programme," says Dr Maddison. "They can help to overcome the physical and financial barriers to typical [cardiac rehabilitation](#)."

Provided by University of Auckland

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