Why is cardiac rehabilitation important?

Cardiac rehabilitation refers to “all measures used to help people with heart disease return to an active and satisfying life and to prevent recurrence of cardiac events” (National Heart Foundation of Australia and Australian Cardiac Rehabilitation Association). These procedures are designed to assist the recovery of patients who have undertaken revascularisation procedures such as vascular bypass surgery, as well as those who are suffering from cardiovascular diseases such as coronary artery disease, stroke and heart failure.

Cardiovascular diseases are one of the major health problems worldwide:
• An estimated 17.7 million people died from a cardiovascular disease in 2015, amounting to 31% of global mortalities
• 1 Australian dies from cardiovascular disease every 12 minutes, making it the number one cause of death in Australia
• 1 in 6 Australians suffer from some form of cardiovascular disease, which equates to a staggering total of approximately 3.72 million people

The importance of cardiac rehabilitation is highlighted by the fact that 1 in 3 heart attack sufferers are repeat patients. Repeated cardiac events increase hospitalisation and readmission rates, and cost the Australian health industry about $8.4 billion per year.

Smartphone solution to cardiac rehabilitation

An iOS application for cardiac rehabilitation was developed that was fully integrated with an existing telehealth architecture known as KIOLA. Measurement devices communicate with the application to store health-related measurements, which are subsequently uploaded to KIOLA. This data can then be reviewed by doctors and clinicians remotely via a web portal, with feedback sent directly back to the patient via the application.

Features

Health data storage
• Record blood pressure, weight, activity and Cardiac Depression Scale (CDS) responses

Health data visualisation
• Visualise blood pressure, weight and activity data over the course of a given day, week, month or year

Measurement history tracking
• Review measurement history by date
• Track synchronisation status with KIOLA

Automatic synchronisation with third party measurement devices
• Record measurements wirelessly via Bluetooth LE
• Extensible device support by implementing the app protocol

Integration with KIOLA telehealth architecture
• Log in to a KIOLA user account
• Synchronise measurements with the KIOLA server

Clinical feedback system
• Receive health feedback from doctors and clinicians

Conclusion

The integration of smartphone technology into cardiac rehabilitation programs has major impacts on the future of telehealth. While traditional cardiac rehabilitation programs required physical clinical follow-ups, smartphone-based programs provide the flexibility for cardiovascular disease patients to manage their health remotely. This is particularly convenient for patients from rural and remote areas with limited access to health infrastructure and resources. This application aims to contribute to the innovative area of cardiac telehealth by providing real-life cardiac rehabilitation patients with comprehensive health management features such as integration with the KIOLA telehealth architecture and extensible support for automatic synchronisation with Bluetooth LE measurement devices. The use of the application will thus have a positive impact on managing the detrimental implications of cardiovascular diseases on society, by improving the health of such patients, reducing their likelihood of experiencing further cardiac events and mitigating the economic burdens associated with hospital readmissions.