Can mobile apps help prevent cardiovascular disease across the lifespan?

Professor Lis Neubeck
School of Health and Social Care
Edinburgh Napier University
Background

- Cardiovascular disease remains the biggest killer globally
- 50% of all CVD hospitalisations are repeat events
- Attendance at cardiac rehab lowers cardiovascular risk factors, improves quality of life and decreases morbidity and mortality
- Cardiac rehab is typically time-limited, facility-based and conducted in groups
- Use of mobile apps may be a solution to increase access to effective prevention
- Explosion of low-cost health-related apps that are not based on evidence
What models?

- Telehealth, home-based and programs delivered in general practice all effective
- Many services now delivering flexible models
- Mobile interventions could provide additional options for those who do not access facility-based CR
eHealth, mHealth, telehealth, Internet, mobile apps...

- **eHealth**: use of emerging communication and information technologies, especially Internet, to improve health and health care
- **mHealth**: use of mobile computing and technologies for health services and information
Quality of apps

- Overall health apps are of low quality
Healthcare apps- IMS review

• Assessed 16,275 apps
• 2/3 aimed at consumers
• Remainder are for health care professionals
• Almost half of apps are misclassified
• Evaluated type and quality of information, data tracking, communication processes and quantity of device capabilities
• On a scoring system of 0-100, average score was 40

Negative messages in mobile apps

• 107 apps promoting smoking available
  – Downloaded by >6 million users
  – Contain information about smoking
  – Share images of favourite brands
  – Advocate smoking

• Food industry developed advergames
  – Product being promoted is a reward or goal for character in a game

BinDhim et al, Tob Control 2014; Dietz, Health Aff 2013
Primordial prevention

• Establishment of healthy living patterns to prevent the emergence of risk factors

• Behavioural, cultural, environmental, economic, or social actions to minimize the potential for developing CVD risk factors

• Examples
  – targeted tobacco control programmes for non-smokers at times when they might adopt smoking behaviour, such as in childhood or adolescence
  – targeted dietary intervention in school-age children to increase fruit and vegetable consumption at home
Primary prevention

- Primary prevention specifically targets known CVD risk factors, such as smoking, excess weight or obesity, or hypertension
- Many apps, but few evidence based
- Apps for diet, fitness trackers, quit smoking...
Secondary prevention

• Limited evidence that apps effectively reduce multiple CVD risk factors
• Many apps available
• Choose reliable source, e.g. Heart Foundation
• Many pharmaceutical companies developing apps
• Takes 18 weeks to develop typical app
App use in children

- 75% children aged >8 years have access to either smartphones or tablets at home
- Although a socioeconomic gap exist for device access and ownership, it is rapidly diminishing
- 80% of high-income parents download apps for their children, whereas only 31% of low-income parents do
App use in adolescents

- Almost 80% of teenagers having their own mobile phone, half of which are smartphones
- At least half of the teenagers with a smartphone access the Internet predominantly via this device rather than any other
- Teenagers use apps for social media or gaming
- In a survey of 7,000 teenagers in the USA, social media apps were the most popular
- Using the principles of social connectivity might benefit young people’s access to CVD prevention
Apps and older adults

• Age itself is not a barrier to app usage

• Apps have been successfully used in the older population to improve physical activity and cognitive function.

• At least 75% of smartphone users aged >65 years have downloaded an app to their device
Apps and older adults

- Challenges of complicated data-usage plans
- Apps that have not been developed for those with declining vision, reduce the likelihood of apps being downloaded and used by older adults
- Some smartphones might even be too small for older users to hold, and challenges are associated with small buttons
- Prefer to refer to a user manual
Digital divide

- 28% of the world’s population currently own and use a smartphone
- 25% increase since 2013
- The rapid development in affordable technology has led to predictions that >50% of people globally will own a smartphone by 2018
- People in low socioeconomic groups retain older technologies, eg mobile telephones that can only send and receive text messages, and which do not have apps
Timeline to app development

![Graph showing the timeline for app development with phases labeled as Funding, Ethics, Recruitment and intervention, and Analysis/publication. The graph tracks the number of apps released (\times 10^6) from July 2008 to Sept 2014 with timelines for iTune App Store and Google Play.]
<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Key Components of Telehealth Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blasco et al.</td>
<td>ACS patients with 1+ cardiovascular risk factor (Spain)</td>
<td>Combination: Telephone, internet, risk factor monitoring by cardiologist, individualised SMS feedback</td>
</tr>
<tr>
<td>Chow et al. (TEXT ME)</td>
<td>Patients &gt;18 years with CHD (Australia)</td>
<td>Text messages, based on American Heart Foundation guidelines, regular semi-personalised messages, individualised risk factor modification</td>
</tr>
<tr>
<td>Johnston et al. (SUPPORT)</td>
<td>MI patients prescribed Ticagrelor (Sweden)</td>
<td>Combination: Smartphone app, self-managed, risk factor monitoring, automated feedback SMS</td>
</tr>
<tr>
<td>Karhula et al.</td>
<td>Patients &gt;18 years with CHD or diabetes (Finland)</td>
<td>Combination: Internet, health coaching, mobile phone coaching to risk factor targets, self-management</td>
</tr>
<tr>
<td>Maddison et al. (HEART)</td>
<td>Patients &gt;18 years diagnosed with IHD within past 3-24 months (New Zealand)</td>
<td>Combination: Internet, web-based exercise intervention, self-managed, behaviour change, internet behavior monitoring, SMS encouragement</td>
</tr>
<tr>
<td>Pfaffl Dale et al. (Text4Heart)</td>
<td>CHD patients with home internet access (New Zealand)</td>
<td>Combination: text messaging, based on CR, patient education, risk factor management, daily messages, Internet support</td>
</tr>
<tr>
<td>Varnfield et al. (CAP-CR)</td>
<td>Post-MI patients referred to CR (Australia)</td>
<td>Combination: smartphone, mentor-managed, motivational/education messages, weekly phone consultation, web monitoring with weekly consultation</td>
</tr>
<tr>
<td>Study</td>
<td>Population/Location</td>
<td>Components of Telehealth Intervention</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Blasco et al.</td>
<td>ACS patients with 1+ cardiovascular risk factor (Spain)</td>
<td>Combination: Telephone, internet, risk factor monitoring by cardiologist, individualised SMS feedback</td>
</tr>
<tr>
<td>Chow et al. (TEXT ME)</td>
<td>Patients &gt;18 years with CHD (Australia)</td>
<td>Text messages, based on American Heart Foundation guidelines, regular semi-personalised messages, individualised risk factor modification</td>
</tr>
<tr>
<td>Johnston et al. (SUPPORT)</td>
<td>MI patients prescribed Ticagrelor (Sweden)</td>
<td>Combination: Smartphone app, self-managed, risk factor monitoring, automated feedback SMS</td>
</tr>
<tr>
<td>Karhula et al.</td>
<td>Patients &gt;18 years with CHD or diabetes (Finland)</td>
<td>Combination: Internet, health coaching, mobile phone coaching to risk factor targets, self-management</td>
</tr>
<tr>
<td>Maddison et al. (HEART)</td>
<td>Patients &gt;18 years diagnosed with IHD within past 3-24 months (New Zealand)</td>
<td>Combination: Internet, web-based exercise intervention, self-managed, behaviour change, internet behavior monitoring, SMS encouragement</td>
</tr>
<tr>
<td>Pfaeffli Dale et al. (Text4Heart)</td>
<td>CHD patients with home internet access (New Zealand)</td>
<td>Combination: text messaging, based on CR, patient education, risk factor management, daily messages, Internet support</td>
</tr>
<tr>
<td>Varnfield et al. (CAP-CR)</td>
<td>Post-MI patients referred to CR (Australia)</td>
<td>Combination: smartphone, mentor-managed, motivational/education messages, weekly phone consultation, web monitoring with weekly consultation</td>
</tr>
</tbody>
</table>
Care Assessment Platform

- RCT (n=120)
- Intervention included daily text messages, multimedia education topics, relaxation audio files, and a light-to-moderate physical activity programme
- Control was usual CR
- Participants using the smartphone app had significantly higher adherence and completion than usual CR group
- Both the intervention group and usual CR significantly improved their 6-min walking test distance (by 60 m and 47 m, respectively)
- Improved depression scores measured using the Depression and Anxiety Stress Scale
- The intervention group lost a small, but significant, amount of weight, but the difference between the groups at follow-up was not significant

Varnfield et al, Heart 2014
TEXT 4 HEART

- RCT (n=123)
- Patients in the intervention group received a personalized 24-week mHealth program, framed in social cognitive theory, sent by fully automated daily short message service (SMS) text messages and a supporting website
- Control was standard cardiac rehab
- A significant treatment effect in favour of the intervention was observed using a self-reported composite health behaviour score at 3 months (P=.03), but not at 6 months (P=.13)
- The intervention group reported significantly greater medication adherence score (P=.004)
- The majority of intervention participants reported reading all their text messages (85%)
- The number of visits to the website per person ranged from zero to 100 (median 3) over the 6-month intervention period

Dale et al, J Med Internet Res 2015
• RCT (n=710)
• Patients in the intervention group (n = 352) received 4 text messages per week for 6 months in addition to usual care
• Text messages provided advice, motivational reminders, and support to change lifestyle behaviours
• Control was usual care
• At 6 months risk factor were significantly improved in intervention group
  – LDL-C ↓ 5 mg/dL (P = .04)
  – Systolic blood pressure ↓ 7.6 mm Hg (P < .001)
  – BMI ↓ 1.3 (P < .001)
  – Physical activity ↑ 345 METS (P < .001)
  – Smoking 26% vs 44% (P < .001)
– The majority reported the text-message program to be useful (91%), easy to understand (97%), and appropriate in frequency (86%)

Chow et al, JAMA 2015
The future

- Wearable technology
- The Internet of Things
- Data sharing to predict health events
Conclusion

- Mobile apps can add to the suite of available options for prevention of cardiovascular disease

- Text messaging has been successful in promoting behaviour change in cardiac patients

- The technology is evolving rapidly and understanding principles is likely to be more important than awareness of every advance in technology
Can mobile apps help prevent cardiovascular disease across the lifespan?

Professor Lis Neubeck
School of Health and Social Care
Edinburgh Napier University
• Scientifically validated model of care
  - Clinical outcomes equivalent to clinic-based care
  - Improvements in uptake, adherence & completion
• Clinician led complement to existing care
• Increases convenience and choice for patients
SMART CR: Patient App

Working together for your health

- Health Measures
- Exercise
- Symptoms
- Goals
- Education
- Relaxation Audio
- Message History
- Settings
- About

The best way to look after your heart is with a healthy lifestyle. Small but lasting changes in your lifestyle choices can protect you from further heart problems.

Blood Pressure

- Average: 109/126
- Maximum: 119/139

Systolic mmHg
128

Diastolic mmHg
96

Heart Rate bpm
85

Read from Bluetooth Device
SMART CR: Patient App

Sam Jones
Working together for your health

Health Measures
Exercise
Symptoms
Goals
Education
Relaxation Audio
Message History
Settings
About

Goals
Lifestyle changes are easier to commit to and achieve when you have goals to work towards. When you reach the target you have set, step things up a bit.

Return to work.
Wed 22/02/2017
Achieve By Fri 03/03/2017

Alcohol
Wed 22/02/2017
Between 0 & 8 standard drinks

Steps
Wed 22/02/2017
Between 8000 & 10000 steps

Education
Videos
Causes of Angina
Not Viewed
Causes of Heart Attack
Not Viewed
Living with Heart Attack
Not Viewed
Risk Factors
Not Viewed
What is a Heart Attack?
Last Viewed: Mon 07/08/2017

Links
Food and Nutrition
Heart Attack Warning Signs
The Heart Foundation

Message History
If you are prescribed statins, you will need to continue taking them for the rest of your life. Stopping taking statins causes cholesterol problems to return.
Received: Mon 07/08/2017

Please watch the ‘Causes of Heart Attack’ video in your app under Education -> Videos.
Received: Mon 07/08/2017

Medications that are effective in lowering cholesterol and reducing the irritability of the artery linings are known as statins.
Received: Mon 07/08/2017

Lives have been saved by statins!
Received: Mon 07/08/2017

Lowering your bad cholesterol (LDL) and triglyceride levels, and increasing your good cholesterol (HDL) will decrease your risk of having another heart attack.
Received: Sun 06/08/2017

Set a goal to get your total cholesterol level to 4mmol/L or below.
Received: Sun 06/08/2017

Exercising, losing weight, a healthy diet and...
## SMART CR: Clinician Portal: Dashboard

### Status | Patient | Diagnosis/Episode/Procedure | Program | Weekly Status
---|---|---|---|---
| | | | | 
| | | | | 
| | | | | 
| | | | | 
| | | | | 

- **Lucas, Cheryl (Mrs)**
  - Born: 12-Mar-1966 (81 yrs)
  - URN: ST87690
  - Status: OK
  - Diagnosis: NSTEMI
  - Date: 02-Jun-2017
  - Discharge: 30-May-2017
  - Program: Home
  - Start: 06-Jul-2017
  - (Wk 5 of 6)
  - Weekly Status: 04-Aug-2017

- **Adams, Ashley (Mr)**
  - Born: 04-Jan-1966 (51 yrs)
  - URN: AB78787
  - Status: Info
  - Diagnosis: Angina (Stable)
  - Date: 24-Jul-2017
  - Discharge: 28-Jul-2017
  - Program: Home
  - Start: Not Started
  - Weekly Status: Adherence Reviews

- **James, Steve (Mr)**
  - Born: 26-Oct-1945 (71 yrs)
  - URN: SD528393
  - Status: Error
  - Diagnosis: Angiogram
  - Date: 13-Jun-2017
  - Program: Home
  - Start: 03-Jul-2017
  - (Wk 6 of 6)
  - Weekly Status: 06-Aug-2017

- **James, Joe (Mr)**
  - Born: 04-Mar-1965 (52 yrs)
  - URN: S82393
  - Status: OK
  - Diagnosis: Angina (Stable)
  - Date: 17-Jun-2017
  - Program: Home
  - Start: 23-Jul-2017
  - (Wk 3 of 6)
  - Weekly Status: 05-Aug-2017
Smart CR Roadmap

• Long term recovery
  • Phase 1,2,3/maintenance
  • +12 month

• Updated messaging
  • Longer term
  • Evidence-based

• Medication adherence

• Survey capability
  • Auto follow up (3/6/12 months)
  • PROMs

• Support for wearables
  • Fitbit, Garmin, etc

• Integrations
  • MyHealthRecord
SMART CR Implementation

• Pre-implementation
  • Educational webinars, demonstrations, site visits.
  • Assistance with business case development
    • Clinical evidence
    • Economic evidence
  • Other specialist information (e.g. questions from IT team)

• Implementation
  • Staff training
  • Staff help desk
  • Software maintenance
  • Software updates
  • Roadmap influence
  • Backups, recovery
  • Uptime, security
Next Steps

• Visit our booth
  • Demos of app and portal
  • Brochures
  • Register for a follow up call or webinar
## Health Technologies Workshop

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.15</td>
<td>Introduction</td>
<td>Chairs: Sandy Hamilton and Robyn Gallagher</td>
</tr>
<tr>
<td>3.15</td>
<td>Introduction to health technology for cardiac patients and related evidence</td>
<td>Lis Neubeck</td>
</tr>
<tr>
<td>3.35-3.55</td>
<td>Australian health technologies for cardiac patients which incorporate health professional advice and/or support</td>
<td>Chair: Sandy Hamilton</td>
</tr>
<tr>
<td>3:35-3:40</td>
<td>Cardihab</td>
<td>Simon McBride</td>
</tr>
<tr>
<td>3:40-3:45</td>
<td>Telemonitoring Enhanced Care for Heart Failure</td>
<td>Nicole Chen/Andrew Maiorana</td>
</tr>
<tr>
<td>3:45-3:50</td>
<td>Avatar-based technology</td>
<td>Robyn Clark</td>
</tr>
<tr>
<td>3:50-3:55</td>
<td>Total cardiac care</td>
<td>Cate Ferry</td>
</tr>
<tr>
<td>3:55-4:05</td>
<td>Cardiac specific apps publicly available</td>
<td>Robyn Gallagher</td>
</tr>
<tr>
<td></td>
<td>• My Cardiac Coach (AHA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• My Heart My Life (NHFA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• MyHeartMate (Figtree, Neubeck, Gallagher et al.,)</td>
<td></td>
</tr>
<tr>
<td>4.05-4.15</td>
<td>Panel Question and Answer</td>
<td>Chairs: Robyn and Sandy</td>
</tr>
</tbody>
</table>
• Daily weight monitoring is important for CHF

• Rapid weight gain reflects fluid retention

• Only 40% patients monitor weight

Process flow diagram for CHF Telemonitoring system

1. **Weight scales**
   - MEPACS call or Questionnaire
   - Sends weight data to ManageMyHealth

   - **VitelMed app**
     - Your weight is **32.7 kg**
     - 07 Nov 2014 12:33
Welcome Mr Richard Kennedy

Weight (Kg)

56.4 Kg
01 Aug 2017 06:28 pm

Chart showing weight measurements from 27 Jul to 01 Aug, with the latest measurement being 56.4 Kg.
Welcome Mr Richard Kennedy

Please answer the following questions.

Feeling unwell?

More short of breath than normal?

Short of breath while lying flat?

Had any light-headedness?

Ankles more swollen?

Submit
Welcome Mr Richard Kennedy

- **Glucose (mmol/L)**: 140 mmol/L (27 Jul 2017, 10:26 am)
- **Temperature (°C)**: 35.6°C (27 Jul 2017, 10:27 am)
- **Weight (Kg)**: 56.0 Kg (27 Jul 2017) and 53.5 Kg (31 Jul 2017)
- **Blood Pressure (mmHg)**: 145/93 (27 Jul 2017, 10:28 am)
# Health Technologies Workshop

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.15</td>
<td>Introduction</td>
<td>Chairs: Sandy Hamilton and Robyn Gallagher</td>
</tr>
<tr>
<td>3.15</td>
<td>Introduction to health technology for cardiac patients and related evidence</td>
<td>Lis Neubeck</td>
</tr>
<tr>
<td>3.35-3.55</td>
<td>Australian health technologies for cardiac patients which incorporate health professional advice and/or support</td>
<td>Chair: Sandy Hamilton</td>
</tr>
<tr>
<td>3.35-3.40</td>
<td>Cardihab</td>
<td>Simon McBride</td>
</tr>
<tr>
<td>3.40-3.45</td>
<td>Telemonitoring Enhanced Care for Heart Failure</td>
<td>Nicole Chen/Andrew Maiorana</td>
</tr>
<tr>
<td>3.45-3.50</td>
<td>Avatar-based technology</td>
<td>Robyn Clark</td>
</tr>
<tr>
<td>3.50-3.55</td>
<td>Total cardiac care</td>
<td>Cate Ferry</td>
</tr>
<tr>
<td>3.55-4.05</td>
<td>Cardiac specific apps publicly available</td>
<td>Robyn Gallagher</td>
</tr>
<tr>
<td></td>
<td>• My Cardiac Coach (AHA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• My Heart My Life (NHFA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• MyHeartMate (Figtree, Neubeck, Gallagher et al.,)</td>
<td></td>
</tr>
<tr>
<td>4.05-4.15</td>
<td>Panel Question and Answer</td>
<td>Chairs: Robyn and Sandy</td>
</tr>
</tbody>
</table>
Objectives

1. to *develop* an avatar-based education application for teaching heart attack symptom recognition and management who are at risk of a heart attack

2. to *evaluate the acceptability* of the avatar-based education application among a group of ACS patients
Action Research

- Content development
- Storyboard/App development
- Expert panel review
- Consumer group reviewed

(Kemmis & McTaggart, 2000)
Content development

(Heart Foundation, 2015)
### Table 1: Changes in ACS response index scores (n=10)

<table>
<thead>
<tr>
<th>Domains</th>
<th>Pre-intervention</th>
<th>Post-intervention</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent correct</td>
<td>Mean ± SD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>62.4 ± 13.4</td>
<td>78.1 ± 9.3</td>
<td>↑15.7</td>
</tr>
<tr>
<td>Attitude</td>
<td>77.0 ± 5.4</td>
<td>97 ± 6.3</td>
<td>↑19.5</td>
</tr>
<tr>
<td>Belief</td>
<td>73.2 ± 6.1</td>
<td>98.9 ± 1.7</td>
<td>↑25.7</td>
</tr>
<tr>
<td>Symptom recognition</td>
<td>72.5 ± 5.6</td>
<td>96.7 ± 8.1</td>
<td>↑24.2</td>
</tr>
<tr>
<td>Help-seeking</td>
<td>83.8 ± 11.9</td>
<td>97.5 ± 7.9</td>
<td>↑13.8</td>
</tr>
<tr>
<td>Expectation</td>
<td>79.4 ± 5.2</td>
<td>100</td>
<td>↑20.6</td>
</tr>
<tr>
<td>Action</td>
<td>65.0 ± 10.9</td>
<td>97.5 ± 4.0</td>
<td>↑32.5</td>
</tr>
</tbody>
</table>
App’s satisfaction

- Easy
- Helped participants’ understanding of heart attack symptoms and recognising and responding to those symptoms
- Increased confidence
- Liked Cora (the Avatar)
- Content is clear and concise
- Learnt something they were not taught before
mHealth to improve completion rates in a hospital-based cardiac rehabilitation program

Cate Ferry
Heart Foundation NSW
The problem being addressed

Whilst home-based alternatives have successfully increased the proportion of patients who attend/complete a cardiac rehabilitation program (CRP) following a cardiac event, comparatively little attention has been devoted to reducing patient dropout rates in hospital-based CRP.
The design and purpose

- A pilot study was conducted in 2015/16 at the Prince of Wales Hospital (POWH) NSW in collaboration with the Heart Foundation NSW to determine if a smartphone-based adjunct to standard care could maintain patient engagement between CRP sessions and increase the completion rate of a hospital-based CRP.

- 66 participants who attended a CRP at POWH were randomized so that half received 3 devices embedded with near-field communication, a smartphone (preinstalled with an app) designed specifically for cardiac rehabilitation, portable blood pressure monitor, and weight scale whilst completing the CRP.
The Graduate School of Biomedical Engineering at the University of New South Wales designed a smartphone app ‘Smartphone Technology and Heart Rehabilitation’ (STAHR) in conjunction with the Austrian Institute of Technology.

The app monitored the patient’s activity level, blood pressure and weight.

Android smartphone (Samsung Galaxy SIII (SG3) preinstalled with STAHR sought to maintain engagement with patients between CRP sessions (every Monday and Thursday) via an automated feedback engine that delivered messages to the participants periodically.
Peripheral devices. Once a weight or BP measurement has been completed, the smartphone can retrieve the readings using the Near-Field Communication (tap the phone against the device) This information is then transmitted to the Kiola server.
Three screenshots from the STAHR app showing the activity timeline throughout the day (left), daily summary (centre) and weekly summary of activity (right).
Current status

- The pilot RCT confirmed the application improved the completion rates of a 12 session cardiac rehabilitation program (88% vs. 67%; p = 0.038).
- The app provides robust monitoring of patient activity, weight and blood pressure.
# Mobile apps for cardiac patients

Robyn Gallagher

## Table 2 | Importance of CVD app features during different life stages

<table>
<thead>
<tr>
<th>App features</th>
<th>Importance at different stages of life*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Childhood</td>
</tr>
<tr>
<td>Gaming principles</td>
<td>+++</td>
</tr>
<tr>
<td>Rewards</td>
<td>+++</td>
</tr>
<tr>
<td>Credible information</td>
<td>–</td>
</tr>
<tr>
<td>Credible referrer</td>
<td>–</td>
</tr>
<tr>
<td>Personalization</td>
<td>+</td>
</tr>
<tr>
<td>Self-monitoring or tracking</td>
<td>–</td>
</tr>
<tr>
<td>Contact with health-care professionals</td>
<td>–</td>
</tr>
<tr>
<td>Social comparison and support</td>
<td>+</td>
</tr>
<tr>
<td>Simplicity</td>
<td>+++</td>
</tr>
<tr>
<td>Privacy</td>
<td>–</td>
</tr>
<tr>
<td>Concise information</td>
<td>–</td>
</tr>
<tr>
<td>Simple data download</td>
<td>–</td>
</tr>
</tbody>
</table>

*Importance was rated on the basis of frequency in the literature, evidence from the literature, and consensus of a multidisciplinary team of expert clinician researchers. Abbreviations: –, feature is not relevant to the target audience; +, feature of low importance to target audience; ++, feature of moderate importance to target audience; ++++, feature of high importance to target audience; CVD, cardiovascular disease.
PURPOSE
• Provide trustworthy information from experts
• Interactive lessons to help you learn what you need to know
• Progress-trackers for monitoring blood pressure and weight
• Tools for logging physical activity and managing medications
• Connections to other survivors through our Support Network
My Cardiac Coach

Features

- Credible information
- Personalisation
- Self-monitoring
- Privacy
- Reminders - tasks
- Simplicity
- Health literacy match
- Rewards
- Game principles
- Social comparison/support
My Heart My Life National Heart Foundation

PURPOSE
• record and manage medicines
• manage health stats including blood pressure and cholesterol
• learn the heart attack warning signs and what to do
• find healthier recipes
My Heart My Life

Features

- Credible information
- Self-monitoring
- Privacy
- Reminders - tasks
- Simplicity
- Health literacy match
- Personalisation
- Rewards
- Game principles
- Social comparison/support
**PURPOSE**

- Increase critical health behaviours through setting and achieving and competing with others for short and long term goals for medication prescriptions, exercise, diet, smoking and stress management recommendations
- Track key behaviours (weight, exercise, cholesterol)
MyHeartMate

Features

- Self-monitoring
- Privacy
- Reminders - tasks
- Simplicity
- Health literacy match
- Personalisation
- Rewards
- Game principles
- Credible information
- Social comparison/support

MyHeartMate features include self-monitoring, privacy, reminders, simplicity, health literacy match, personalisation, rewards, game principles, and credible information. The features are supported with icons indicating their level of integration or importance.
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.15</td>
<td>Introduction</td>
<td>Chairs: Sandy Hamilton and Robyn Gallagher</td>
</tr>
<tr>
<td>3.15</td>
<td>Introduction to health technology for cardiac patients and related evidence</td>
<td>Lis Neubeck</td>
</tr>
<tr>
<td>3.35-3.55</td>
<td>Australian health technologies for cardiac patients which incorporate health professional advice and/or support</td>
<td>Chair: Sandy Hamilton</td>
</tr>
<tr>
<td>3.35-3.40</td>
<td>Cardihab</td>
<td>Simon McBride</td>
</tr>
<tr>
<td>3:40-3:45</td>
<td>Telemonitoring Enhanced Care for Heart Failure</td>
<td>Nicole Chen/Andrew Maiorana</td>
</tr>
<tr>
<td>3.45-3.50</td>
<td>Avatar-based technology</td>
<td>Robyn Clark</td>
</tr>
<tr>
<td>3:50-3:55</td>
<td>Total cardiac care</td>
<td>Cate Ferry</td>
</tr>
<tr>
<td>3:55-4:05</td>
<td>Cardiac specific apps publicly available</td>
<td>Robyn Gallaher</td>
</tr>
<tr>
<td>• My Cardiac Coach (AHA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• My Heart My Life (NHFA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• MyHeartMate (Figtree, Neubeck, Gallagher et al.,)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.05-4.15</td>
<td>Panel Question and Answer</td>
<td>Chairs: Robyn and Sandy</td>
</tr>
</tbody>
</table>