

# Country Heart Attack Prevention (CHAP) Project

END OF PROJECT  
REPORT (30 JUNE 2023)



NHMRC PARTNERSHIP  
PROJECT: GNT1169893  
(2019-2023)

Country Heart Attack Prevention  
(CHAP) Project



Heart Health for life





# Country Heart Attack Prevention (CHAP) Project

A four step model of care and clinical pathway for the translation of cardiac rehabilitation and secondary prevention guidelines into practice for rural and remote patients.

## Acknowledgment of Country

*This project was conducted from Flinders University, on the traditional lands of the Kurna people. We acknowledge and pay respect to the Kurna people as the traditional custodians of the Adelaide region. We also acknowledge the deep feelings of attachment and the relationship of the Kurna people to their Place. We pay our respects to the Kurna ancestors and the living Kurna people.*



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*“As a result of 3 years implementing current evidence into practice, South Australian country cardiac patients now have access to the best evidence-based, patient centred and cost effective international standard of cardiac rehabilitation in the nation”.*

- PROF ROBYN CLARK



# Executive Summary

## SYNOPSIS

Despite high level evidence, supporting the proven benefit of risk factor modification to reduce secondary events through Cardiac Rehabilitation (CR), statistics from Australia and around the world report that only 20-50% of eligible patients attend and attendance has not improved in the past 20 years.

This project is a \$3.3M partnership between consumers, policy makers, service providers, clinicians and researchers to integrate research evidence into policy and practice for the delivery of rural and remote CR.

The Country Heart Attack Prevention (CHAP) project from 2019 to 2023:

1. Engaged clinicians to recommend CR,
2. Will continue to develop an effective auto-referral system, after the CHAP project finishes,
3. Provided choice of mode of delivery (Face-to-Face, Telephone, Mobile Apps and Web based) and,
4. Provided long term support for heart health from primary carers.

**We hypothesised that compared to usual care, rural and remote patients who are exposed to the CHAP model will have higher rates of attendance (primary outcome) and completion; modification of risk factors; evidence-based pharmacotherapy and positive experiences of their clinical care.**

The Partners: Department for Health and Wellbeing, SA Health; Country Health SA; Country SA Primary Health Network; Heart Foundation; AstraZeneca; Novartis; Flinders Foundation; the Cardiac Society of Australia & New Zealand (CSANZ), Royal Australian College of General Practice (RACGP); Australian Cardiac Rehabilitation Association (ACRA) and Exercise Scientists Society of Australia (ESSA) and Flinders University, invested a total of \$1,957,887 (Cash \$728,593 + In-kind \$1,229,294) demonstrating support for the project and team. The CHAP model targeted a broad area of healthcare, as prioritised by the NHMRC Partnership Scheme, including secondary prevention, primary and community healthcare, hospitals, workforce, and infrastructure.

## IMPACT STATEMENT

This project was built on the foundations of strong partnerships and on being one of the first clinical pillars of Health Translation South Australia (HTSA) with Wendy Keech, Prof Steve Nicolls and Prof John Beltrame, translating evidence into an internationally significant clinical model for rural and remote cardiac care provided by the Integrated Cardiovascular Clinical Network of South Australia (iCCnet SA) led by Dr Phil Tideman and Rosy Tirimacco.

Impact for CR and secondary prevention for rural and remote patients:

1. South Australia (SA) cardiac patients can now access the only models of CR in Australia that have been co-designed by consumers and clinicians,
2. At the time of this report, we are working to achieve the first ever Internationally accredited CR Service in Australia at the Northern Adelaide Local Health Network,
3. The CHAP Project has harmonised data quality and clinical outcomes to benchmark with national and international standards. for measuring the quality of care,
4. Conducted the first clinical audit since 2016 on the quality and outcomes of SA CR programs and reported these data to individual sites with whole of state outcomes, to ACRA SA/NT Community of Practice and Statewide Cardiac Clinical Network for review and implementation of quality improvement strategies.
5. Local statewide standardisation has occurred for discharge letters and measuring patient reported experience measures (PREMS),
6. We have demonstrated the value of providing Continuing Professional Development (CPD) and building and supporting a community of practice (to address the unique challenges to practice for rural and remote clinicians) often at a disadvantage to access mainstream conferences and workshops,
7. We have demonstrated the value of providing public lectures to patients and families about the daily challenges they face managing their cardiac health,

8. One of the most important clinical outcomes from the CHAP Project was the business model for implementation of CR models especially in rural and remote areas without formal CR programs. Review of this business model by Medicare informed us that it was a legitimate use of many “underutilised” item numbers for cardiac care and chronic disease management.
9. In the ultimate outcome for any implementation project and the success of the translation of CR evidence into practice, the CHAP Model of CR care is to be upscaled and rolled out across the State of SA.

## IMPACT OUTCOMES

The publications, dissemination and academic outcomes from this project can only be described as world class and internationally significant:



**37 Publications/Papers**



**62 Presentations**



**29 CPD Sessions**



**12 Co-design  
'Roadshow' Workshops**



**6 Successful Grants**



**4 Post Doctoral Fellowships**



**2 PhD Students Recruited**



**7 Awards**

## SOCIAL MEDIA IMPACT



**Over 650 Followers  
@CHAPproject**



**Over 6000 Website views  
chaproject.com.au**

***'To all the country participants who gave so much time and effort to communicate and work with us to provide expert opinion on what is important to them and how to make things better, we say thank-you.'***

## NHMRC PROJECT MANAGEMENT IN A PANDEMIC

The project commenced in 2019 prior to the pandemic, the project was thwarted by recruitment and administration systems issues. With the arrival of the pandemic in 2020, any non-COVID clinical research was deprioritised, and progress was challenging on a daily basis. The outcomes of this project speak for themselves, and are due to the incredible resilience of our team and the belief that what we were doing was important for patient care.

However, I would like to acknowledge the leadership and mentorship of the Chief Investigators, Associate Investigators, Partners, Consumer Teams and Governance Committee. I was informed retrospectively that the main reason this grant was successful at NHMRC was that we had bought together leadership and partnership that represented all health networks (no silos) and healthcare partners across the continuum of care.

Our pharmaceutical partners (Astra Zeneca and Novartis) were also extremely important because it was their contribution that supported our consumer engagement “Roadshows” and dissemination of outcomes “Showcases”.

As well as improving patient care, the next most important outcome of the CHAP Project which must be celebrated is the development and stellar success of the group of early career young women researchers and our Research Project Manager that I have had the privilege to mentor and lead for the past 3 years.

The outcomes of this project are entirely due the vision for equity in access to cardiac care for rural and remote patients that was the mantra of iCCnet, the primary clinical partner of the CHAP Project.

Finally, at the core of this project were our patients, carers and families. To all the country participants who gave so much time and effort to communicate and work with us to provide expert opinion on what is important to them and how to make things better, we say thank-you.



# Thank you Dr Philip Tideman, Rosy Tirimacco and the iCCnet Team



*“Thanks to the CHAP project team for standardising measurable quality in cardiac rehabilitation programs, including how and where CR can be delivered”.*

- DR PHIL TIDEMAN



*Dr Alline Belegoli, Dr Phil Tideman and Katie Nesbitt at Successes and Failures in Telehealth Conference (STF-22) in Brisbane November 2022*

A huge thank you goes to the team at iCCnet SA, the primary clinical partner of the CHAP Project led by Dr Phil Tideman and Rosy Tirimacco for all their support and active involvement during the CHAP project.

The fundamental aim of iCCnet SA is to remove barriers to access safe cardiovascular care and to improve clinical outcomes. The success of the network is based on comprehensive collaboration and integration of services between rural and remote health workers and other service providers across all cardiovascular health sectors.

Dr Philip Tideman is the Clinical Director of iCCnet SA who trained at the Royal Hobart and Royal Adelaide hospitals, completing Cardiology specialist training at Flinders Medical Centre. He has spent years building up an extensive clinical Cardiology practice in the southern metropolitan and south-eastern country areas of SA as well as a Population Health and Health Services cardiovascular research program at Flinders University.

Rosy Tirimacco is the Operations and Research Manager of iCCnet SA who has extensive experience in implementing and running point-of-care testing (PoCT) in hospitals and general practice. She is heavily involved in PoCT education of rural doctors and nurses across SA and is particularly interested in the integration of PoCT into clinical care pathways.

Both leaders have been involved in this grant as Investigators and Rosy Tirimacco was an active member of the Project Team and involved in the regular Governance Committee Meetings.

# Acknowledging our Team

## RESEARCH TEAM

The research team, comprising of 10 Chief Investigators (CI) and 6 Associate Investigators (AI) brought a collective expertise in translating research evidence into health policy and practice to enhance Cardiac Rehabilitation services and more importantly, better self-care and quality of life for consumers.



### Prof Alex Brown

BMed, MPH, PhD, FRACP, FCSANZ, FAAHMS

Aboriginal Health Equity Theme Leader at SAHMRI, and Professor of Medicine at the University of Adelaide

**Role Statement:** CIC Brown's role in the partnership project team was to drive policy and practice change at a local and national level.



### Prof Robyn Clark

RN., RM., ICU Cert., DipApplSci., BN., M.Ed., PhD., ACCCN (Life Member), FCNA, FAHA, FCSANZ

Professor of Acute Care & Cardiovascular Research, Caring Futures Institute, Flinders University and Clinical Chair & Director of Nursing and Midwifery Research Southern Adelaide Health Network (SALHN)

**Role Statement:** CIA Clark led all aspects of the partnership project and provided leadership to the team.



### Prof Derek Chew

MBBS, FRACP, MPH, PhD

Professor of Cardiology, Flinders University

**Role Statement:** CID Chew contributed his expertise in quality and safety, data management and leadership in research translation.



### Prof Stephen Nicholls

MBBS, PhD, FRACP, FACC, FESC, FAHA, FCSANZ, FAHMS MBBS, PhD, FRACP, FACC, FESC, FAHA, FCSANZ, FAHMS

Director, MonashHeart, and Professor of Medicine, Monash University

**Role Statement:** CIB Nicholls provided advice for the translation of research findings to drive policy change.



### Prof John Beltrame

BSc, BMBS, FRACP, PhD, FESC, FACC, FCSANZ, FAHA

Medicine Lead, University of Adelaide, Director of Research CALHN and Senior Consultant Cardiologist

**Role Statement:** CIE Beltrame contributed his experience and comprehensive understanding of CHD, health service research, his translational experience and skillset in global benchmarking and patient-related outcome measures.





### Prof Anthony Maeder

Bsc (Hon), MSc, PhD, FIAHSI, FAIDH, FACS, FIEAust, CPEng, NER, APEC Eng, IntPE (Aus), SMIEEE, CHIA

Chair in Digital Health Systems, Flinders University (retired in 2020)

**Role Statement:** CIF Maeder contributed to the overall project providing expert input to software design and development, and expertise on wearables and medical devices involved in the project.



### Prof Jereon Hendriks

RN, MSc, PhD

Leo J Mahar Cardiovascular Nursing Chair, Flinders University and Department of Cardiology, Royal Adelaide Hospital

**Role Statement:** CII Hendriks' brought his knowledge and experience in the implementation and delivery of structured nurse-coordinated patient management including cardiovascular risk factors management strategies.



### Assoc Prof Carol Maher

BPhys (Hon), PhD

Professor of Population and Digital Health, University of South Australia

**Role Statement:** CIG Maher contributed her expertise in measurement of lifestyle patterns and technology-based interventions.



### Dr Philip Tideman

MBBS, FRACP

Clinical Director, Integrated Cardiovascular Clinical Network (iCCnet) SA/Flinders University

**Role Statement:** CIJ Tideman provided clinical leadership, through his strong relationships with rural GPs, nurses, allied health professionals and health executives across all areas of rural SA and contributed to rural health policy development, standards development, governance and advocacy.



### Assoc Prof Vincent Versace

BSc, PhD

Clinical Director, Integrated Cardiovascular Clinical Network (iCCnet) SA/Flinders University

**Role Statement:** CIH Versace worked with other CIs to develop a robust and feasible statistical evaluation plan for the different aspects of the CHAP study, that facilitated successful translation of research findings.

## RESEARCH TEAM (CONT.)



### Assoc Prof Billingsley Kaambwa

BA, MA(Health Econs), PhD  
A/Prof Health Economics and Head,  
Health Economics Unit, Flinders  
University

**Role Statement:** AI Kaambwa provided leadership for the Health Economist and the CHAP health economics evaluation.



### Ms Rosy Tirimacco

BSc  
Operations & Research Manager,  
Integrated Cardiovascular Clinical  
Network (iCCnet) SA

**Role Statement:** AI Tirimacco was an active member of the Project Team and involved in the regular Governance Committee Meetings.



### Ms Wendy Keech

BA, Grad Dip, MPH  
Chief Executive Officer, Health  
Translation SA/SAHMRI

**Role Statement:** AI Keech provided leadership of translational aspects of the projects.



### Prof Christopher Zeitz

MBBS, PhD, FRACP  
Director of the Cardiology  
Assistance to Remote Districts in  
Australia, University of Adelaide/  
CARDIA SA

**Role Statement:** AI Zeitz provided advice on rural and remote cardiology and data management.



### Dr Ivanka Prichard

BBSoc (Psyc Hon), PhD  
Co-Deputy Director of the  
SHAPE (Sport, Health, Activity,  
Performance, & Exercise) Research  
Centre, Flinders University

**Role Statement:** AI Prichard provided consultation on psychometric measures and activity measures.



### Dr Rosanna Tavella

Bsc (Hon), PhD  
Clinical Data Manager, Central  
Adelaide Local Health Network,  
SA Health

**Role Statement:** AI Tavella provided advice and co-lead the CREW project and sub.

*'I would like to acknowledge all the people involved in this project including the Research Team, Partners, Consumers, Project Team, and Governance Committee members. Without their support, this project would not have been such a success.'*

- PROF ROBYN CLARK

## PARTNERS



### Country SA Primary Health Network (PHN)

**Ms Frances Graetz**  
(previously Ms Ali Krollig)

Country SA PHN provided access to data and outcomes.



### Heart Foundation

**Ms Vanessa Poulson**  
Senior Healthcare Programs Officer  
(previously Natasha Schranz)

The Heart Foundation's contribution supported the translation of the CHAP model into practice.



### AstraZeneca

**Mr Steven Pados**  
Business Development Manager  
(previously Mr Andrew Tayler)

AstraZeneca sponsored our postdoctoral pharmacist, Dr Lemlem Gebremichael.



### Novartis

**Ms Rachel Booth**  
CRM Executive Account Specialist  
and Ms Rose Mollica-Merchant,  
Head of Healthcare Solutions

Novartis supported the 12 co-design workshops and the CHAP Showcases.



### Flinders Foundation

**Mr Ross Verschoor**  
Executive Director

Flinders Foundation provided input into the design and development of multi-modal delivery of cardiac rehabilitation.



### The Cardiac Society of Australia & New Zealand (CSANZ)

**Assoc Prof Carmine De Pasquale**  
Chair SA Region

The CSANZ provided professional input into the design and implementation of education materials, tools and project development.



### Royal Australian College of General Practice (RACGP)

**Dr Ken Wanguhu**  
National Rural Facility Censor

The RACGP's contributions included partnership and collaboration in the design of education materials, tools and project development relating to GP endorsement of CR.



### Australian Cardiovascular Health & Rehabilitation Association (ACRA)

**Ms Celine Gallagher**  
President, SA Region

ACRA provided professional input into the design and implementation of education materials, tools and project development.



### Association and Exercise Scientists Society of Australia (ESSA)

**Ms Kirsty Rawlings**  
President  
(previously Anita Hobson-Powell)

The Exercise and Sports Science Australia provided professional input into the design and implementation of education materials, tools and project development.



### Department of Health & Wellbeing, SA Health

**Ms Michele McKinnon**  
Executive Director

The Dept provided funding to design and implement a safety and quality accreditation for all rural and remote CR and secondary prevention services.





### **Integrated Cardiovascular Clinical Network SA (iCCnet SA), Rural Support Service, SA Health (previously Country Health SA)**

#### **Ms Rosy Tirimacco**

Operations and Research Manager

iCCnet SA are the leaders in delivering virtual cardiology who worked closely with the research team.



### **Flinders University**

#### **Prof Robert Saint**

Deputy Vice-Chancellor (Research)

Flinders University contributed funds to support the CHAP project.



### **Monash University**

#### **Prof Stephen Nicholls**

Director, Monash Heart and Prof of Medicine, Monash University

Collaborative Partner and in-kind support for Prof Steve Nicholls.



### **University of Adelaide**

#### **Prof John Beltrame**

Medicine Lead, University of Adelaide, Director of Research CALHN and Senior Consultant Cardiologist and Prof Chris Zeitz, Head of Cardiology Unit, The Queen Elizabeth Hospital

Collaborative Partner and in-kind support for Prof John Beltrame.



### **University of South Australia**

#### **Prof Carol Maher**

Professor of Population and Digital Health, University of South Australia

Collaborative Partner and in-kind support for Prof Carol Maher.



### **Deakin University**

#### **Prof Vincent Versace**

Director, Deakin Rural Health, Deakin University

Collaborative Partner and in-kind support for Prof Vincent Versace.



### **Health Translation South Australia (HTSA)**

#### **Ms Wendy Keech**

CEO, Health Translation SA

Collaborative partner and in-kind support for Director Wendy Keech.



### **South Australian Health and Medical Research Institute (SAHMRI)**

#### **Prof Stephen Nicholls**

Director, Monash Heart and Professor of Medicine, Monash University

Collaborative Partner  
Access to SAHMRI facilities for Seminars and workshops.



### **Caring Futures Institute (CFI)**

#### **Prof Raymond Chan**

Director

The CIF team supported with the CHAP team as part of their broader team including office space.



Clayton Bester, consumer representative, Broadcaster / Producer at Flow FM



Murray Bridge Workshop in February 2021

*“After having a heart attack, I undertook cardiac rehabilitation in the Barossa for 6 weeks but think it should be available to me for the rest of my life.”*

- CLAYTON BESTER, CONSUMER

## CONSUMERS

We would like to acknowledge and thank all the consumers involved and their contribution towards the CHAP project, especially Clayton and Etta Bester for being involved from the beginning to the end of the project.

Clayton and Etta were involved in some of the co-design workshops to develop web-based CR at the start of the project. Clayton was also a valued member of our Governance Committee, and both were actively involved in a number of CHAP events sharing details about their experiences during their cardiac episodes and the rehabilitation process, including at the final CHAP Showcase in June 2023..

Another couple of consumers who we would like to acknowledge include Ali Krollig and Wendy Siefert for their contribution.

We would also like to acknowledge the 39 consumers who participated in the 12 ‘Roadshow’ workshops including 6 co-design web development workshops and 6 usability testing workshops held throughout SA during 2020-2021 to provide input and feedback during the development of the CR website. There were 74 participants in total, with most of the consumers attending both workshops.

## PROJECT TEAM

The hard working and inspiring Project Team, were responsible for translating the project's visionary objectives into deliverable actions to achieve quality outcomes within the specified project timeline and budget.

The majority of the Project Team were Early Career Women including:

- iCCnet Operations and Research Manager
- Project Manager
- 2 PhDs
- 4 Post Doctoral Researchers



### Prof Robyn Clark

RN., RM., ICUCert., DipAppliSci., BN., M.Ed., PhD., ACCCN (Life Member), FCNA, FAHA, FCSANZ  
CHAP Project Lead Investigator,  
Flinders University

**Sub-Project Lead:** Accreditation



### Ms Rosy Tirimacco

BSc  
Project Lead Partner Investigator,  
Integrated Cardiovascular Clinical  
Network (iCCnet) SA

**Sub-Project Lead:** e-Referral



### Dr Aline Beleigoli

MD, PhD  
Senior Research Fellow, Flinders  
University

**Sub-Project Lead:** Data Linkage,  
CREW and CR4ALL



### Dr Norma Bulamu

BPharm, MPH, PhD  
Health Economist, Flinders  
University

**Sub-Project Lead:** Business Model  
and Cost Effectiveness



### Dr Stephanie Champion

Postdoctoral Research Fellow,  
Flinders University

**Sub-Project Lead:** Continuing  
Professional Development  
(until 2021)



### Mr Jon Foote

Data Manager, Flinders University

**Sub-Project Lead:** Data  
and Web Management



### Dr Lemlem Gebremichael

BPharm, MSc, PhD

Clinical Pharmacy Research Fellow,  
Flinders University

**Sub-Project Lead:** Evidence Based  
Pharmacotherapy and Patient  
Reported Experience Measures



### Ms Katie Nesbitt

BNursing, MSc

PhD Candidate, Flinders University

**Sub-Project Lead:** Development of  
Web-based Program



### Ms Sarah Powell

Project Manager, Flinders University

**Sub-Project Lead:** Risk  
Management, Finance, Contracts,  
Reporting, Events



### Dr Joyce Ramos

PhD, AES, AEP

Senior Lecturer/Course  
Coordinator, Flinders University

**Sub-Project Lead:** Continuing  
Professional Development (2021),  
CREW, Integration of Activity  
Monitoring Devices



### Ms Orathai Suebkinorn

PhD Candidate,  
Flinders University

**Sub-Project:** CREW



## GOVERNANCE COMMITTEE

The Governance Committee provided strategic advice to the Project Team. The Committee Members were by nomination and each one of them represented key expertise that were critical for informed governance for the Project Team. The Committee convened twice a year to review the progress of the project deliverables, approve the project budget expenditures, and support the stakeholder engagement activities.

**Special acknowledgment to Dr Hendrika Meyer as Governance Committee Chair, for mentoring the CHAP team in advanced risk management skills, always bringing a positive vibe and passionate commitment to this important project.**



### Dr Hendrika Meyer

Chief Clinical Advisor, Rural Support Service South Australia, SA Health

**Position on Committee:** Clinical Advisor (Chairperson)



### Prof Steve Nicholls

Director, Monash Heart and Professor of Medicine, Monash University

**Position on Committee:** Clinical Trials Expert (Co-Chairperson)



### Mr Clayton Bester

Broadcaster/Production at Flow FM

**Position on Committee:** Consumer Representative



### Was Ali Krollig then Frances Graetz

Manager, Country SA Primary Health Network

**Position on Committee:** Partner Organisation Representative



### Ms Wendy Keech

CEO, Health Translation SA

**Position on Committee:** Translation Expert



### Ms Michele McKinnon

Executive Director, Provider Commissioning and Performance, Department for Health and Wellbeing SA, SA Health

**Position on Committee:** Data Expert



### Ms Rose Mollica-Merchant

Head of Healthcare Solutions, Novartis

**Position on Committee:** Industry Partner Representative



### Ms Kim Morey

Aboriginal Health Equity Researcher, SAHMRI

**Position on Committee:** Aboriginal Health Expert



### Mr Tony Potts

Better Care Coordinator, Regional Local Health Network, SA Health

**Position on Committee:** End-User Representative



### Ms Kirsty Rawlings

President, Exercise & Sports Science Australia

**Position on Committee:** Partner Organisation Representative

*“Congratulations Robyn and team on all the work that has been done, I am really impressed by the methodologies being used that are really robust and having University partnership is absolutely fantastic”.*

- DR PHIL TIDEMAN



# Project Background

## \$3.3M NHMRC Partnership Grant delivered between 2019 to 2023 with 20 Project Partners (11 Financial), 10 Chief Investigators and 6 Associate Investigators

This National Health and Medical Research Council (NHMRC) Partnership Grant GNT1169893 won by Professor Robyn Clark and her team with a total project value of \$3.3million (\$1.3M NHMRC and \$1.9M from partners) was delivered between 1 October 2019 to 30 June 2023. It was initially a 3-year funded project that was extended with an additional year due to COVID.

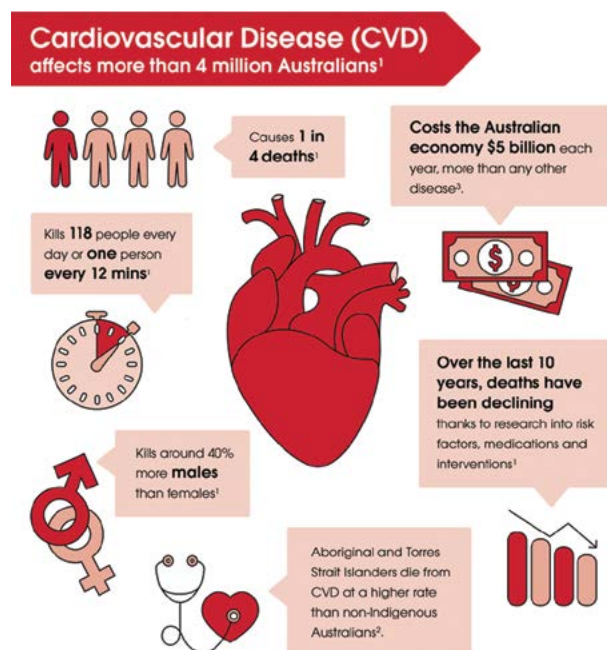
### INTRODUCTION

Cardiovascular diseases (CVD) are the number one cause of death globally, taking an estimated 17.9 million lives each year. CVDs are a group of disorders of the heart and blood vessels and include coronary heart disease, cerebrovascular disease, rheumatic heart disease and other conditions such as heart failure and arrhythmias. (WHO 2021).

CVD kills one Australian every 12 min and is a major cause of mortality accounting for 43,300 deaths (25% of all deaths) in 2019. Of particular concern are those Australians living in rural and remote areas, who have 90% higher rates of CVD-related hospitalisation and 60% higher rates of CVD death than those in metropolitan areas. (ABS 2020; AIHW 2018).

*“Outstanding work by the CHAP team, fantastic, keeping going, don’t stop”.*

- CLAYTON BESTER, CONSUMER



<https://www.heartfoundation.org.au/activities-finding-or-opinion/key-stats-cardiovascular-disease>

### CARDIAC REHABILITATION

Cardiac rehabilitation (CR) is the sum of interventions required to ensure physical, psychological and social recovery for patients after an acute cardiovascular event. (Woodruffe et al 2015).

Despite high levels of evidence supporting benefit and cost-effectiveness of risk factor modification to reduce secondary CVD events through CR, Australian and international statistics for the past 20 years report that only 20%–50% of eligible patients participate. (Jelinek 2015; National Heart Foundation 2018).

CR is traditionally delivered face to face or via a telephone providing prescriptive secondary cardiovascular prevention support, including education around risk factor management.



## PRELIMINARY DATA AND BACKGROUND

Preliminary data and background leading to the Country Heart Attack Prevention (CHAP) Project have been developed over a decade (2009–2018) through a long-standing partnership among local researchers, clinicians and health service managers. Through this partnership, our team have summarised the evidence around CR, identified local barriers and implemented and measured performance of a series of initiatives to improve CR referral, attendance and completion.

Limited referrals to CR, lack of patient-centred approaches and individualised choices, lack of sustainable lifelong commitment to CR supported by primary care and heterogeneous CR quality have been identified as main barriers..

## AIM

### Translate evidence and guidelines to increase attendance and completion of Cardiac Rehabilitation for patients living in rural and remote South Australia.

The aim of the CHAP Project was to develop and implement evidence-based approaches to address modifiable barriers to accessing and successfully completing CR in rural and remote areas of SA.

We hypothesised that compared with patients not exposed to the CHAP model of care (ie, receiving standard care), patients exposed to CHAP will have higher rates of attendance and completion of CR, higher rates of risk factor modification and higher rates of adherence to evidence-based pharmacotherapy; and experience lower rates of morbidity and mortality at 30 days and 12 months and that the model will demonstrate cost-effectiveness for both services and patients.

## OBJECTIVES

Specific objectives of the CHAP Project were to:

1. Refine the CHAP Model for Implementation.
2. Evaluate the clinical effectiveness of the CHAP model.
3. Evaluate the cost-effectiveness of the CHAP model.
4. Implement a sustainable model of care beyond the CHAP translation project.

## METHOD

The CHAP Project used a translation methodology combining a prospective case control design combined with the Model for Large Scale Knowledge Translation and a comprehensive economic analysis to facilitate implementation of evidence-based interventions into practice.

## ETHICS

This study was approved by the Southern Adelaide Clinical Human Research Ethics Committee on 28 April 2020 (HREC/20/SAC/78). The data linkage between the SA CR clinical database and the Department of Health administrative databases was approved by the Department for Health and Wellbeing Human Research Ethics Committee on 26 August 2021 (2021/HRE00270). All eligible participants had consent waiver for their data to be used for this research.

## SETTING

The CHAP model of care was implemented within the six local health networks in regional, rural and remote SA through iCCnet. 23 CR services and the CATCH telephone service participated.

1. Barossa Hills Fleurieu LHN
2. Eyre and Far North LHN
3. Limestone Coast LHN
4. Riverland Mallee Coorong LHN
5. Yorke and Northern LHN
6. Flinders & Upper North LHN

## PARTICIPANTS

All adults (≥18 years) including Aboriginal and Torres Strait Islander peoples, discharged from hospital with a diagnosis that meets the eligibility criteria to CR (acute myocardial infarction, hypertensive heart disease, ischaemic heart disease, arrhythmias, and/or heart failure, coronary artery surgery, percutaneous coronary intervention and ventricular assist device) (Woodruffe 2015) and living within the six SA local health networks in regional, rural and remote areas were eligible to the CHAP model of care. The comparison group (non-exposed to CHAP) comprised of age, sex and DRG matched controls not living in these regional, rural and remote areas.

## DATA SOURCES

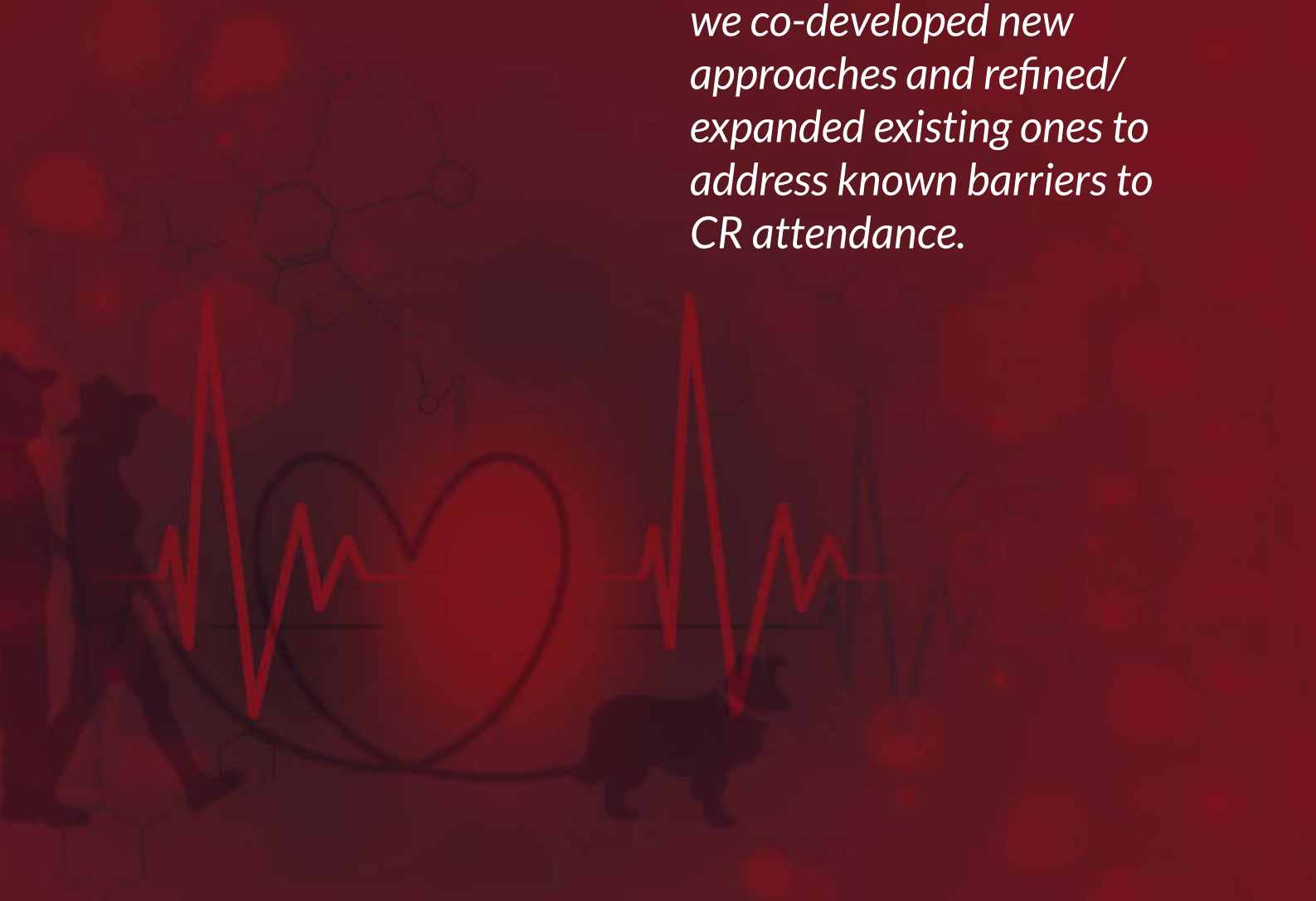
The SA CR clinical database, known as the CATCH (Country Access to Cardiac Health) database centralises the referrals to CR from public and private hospitals and health providers across metropolitan, rural and remote areas. Also, using a standardised electronic entry process, it captures clinical data populated by CR clinicians across SA.

The CATCH database was linked to South Australian hospitals and deaths databases to enable understanding of the number of referrals among the eligible patients and assessment of the project's secondary outcomes – hospital re-admissions and mortality.

## INCOME

	Cash \$	In-Kind	Total Contribution
Department for Health and Wellbeing, SA Health	100,227	20,000	120,227
Rural Support Service, SA Health (was Country Health SA)	211,390	731,462	942,852
Country SA Primary Health Network (PHN)		247,214	247,214
Heart Foundation	151,000	15,000	166,000
AstraZeneca	151,476		151,476
Novartis	29,500	115,618	145,118
Flinders Foundation	25,000	20,000	45,000
Flinders University Co-Investment	60,000		60,000
The Cardiac Society of Australia & New Zealand (CSANZ)		20,000	20,000
Royal Australian College of General Practice (RACGP)		20,000	20,000
Australian Cardiac Rehabilitation Association (ACRA)		20,000	20,000
Association and Exercise Scientists Society of Australia (ESSA)		20,000	20,000
<b>Partner Total</b>	<b>\$ 728,593</b>	<b>\$ 1,229,294</b>	<b>\$ 1,957,887</b>
<b>NHMRC Grant</b>	<b>\$ 1,386,123</b>		<b>\$ 1,386,123</b>
<b>TOTAL</b>	<b>\$ 2,114,716</b>	<b>\$ 1,229,294</b>	<b>\$ 3,344,010</b>

*The CHAP project implemented a model of care to cardiac rehabilitation in rural Australia. Partnering with patients, clinicians and health service managers, we co-developed new approaches and refined/expanded existing ones to address known barriers to CR attendance.*



# CHAP Model of Care

## OBJECTIVE 1: REFINING THE CHAP MODEL FOR IMPLEMENTATION

To facilitate implementation of evidence-based interventions into practice, the Model for Large Scale Knowledge Translation, which is particularly useful for large-scale collaborative projects involving researchers and clinical staff was used (Pronovost 2008).

The first three of the four stages of the model for large-scale knowledge translation of preliminary work (1. Summarise the evidence; 2. Identify local barriers, and 3. Measure performance) was undertaken in the decade prior (2009–2018) by researchers in our team and ended up being repeated as a new cycle of knowledge translation including:

1. systematic review on the effectiveness of alternative modes of delivery of CR (Clark 2015)
2. identification of local barriers to CR attendance (Astley 2017)
3. the establishment of a central referral system (CATCH central referral system) and telephone-based program (CATCH telephone program) (Astley 2017).

The fourth stage of the model was developed to ensure all patients receive the intervention uses the ‘four Es’ approach to improve reliability: engage, educate, execute and evaluate. To complete this stage, the team worked closely with health networks and CR services addressing barriers to implementing the CHAP model of care in rural and remote areas across the state.

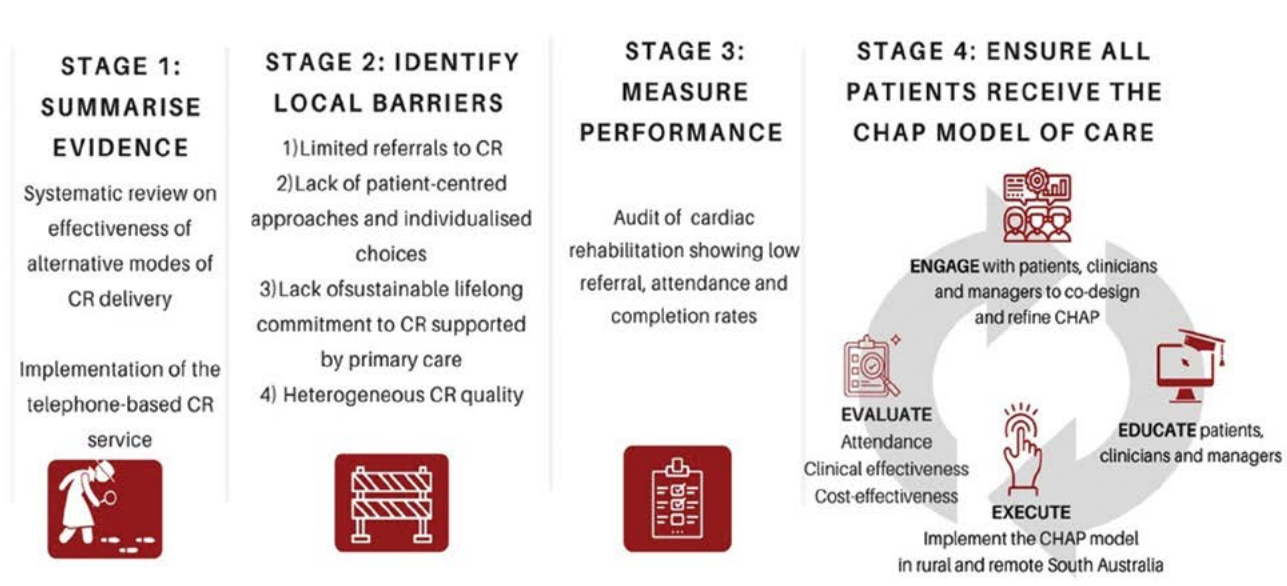
## Stage 1 – Summarise Evidence

A systematic review on the effectiveness of alternative modes of delivery of CR in 2015 identified traditional hospital-based model of CR face substantial challenges, such as cost and accessibility and that local healthcare systems should strive to integrate alternative models of CR, such as brief telehealth interventions tailored to individual’s risk factor profiles as well as community- or home-based programs, in order to ensure there are choices available for patients that best fit their needs, risk factor profile, and preferences (Clark et al 2015).

Clark R.A, A. Conway, V. Poulsen, W. Keech, R. Tirimacco and P.Tideman. **“Alternative models of cardiac rehabilitation: A systematic review”** *European Journal of Preventive Cardiology*, Volume 22, Issue 1, 1 January 2015, Pages 35–74, <https://doi.org/10.1177/2047487313501093>

A Systematic Review Club was established in June 2021 led by Prof Robyn Clark and Prof Jeroen Hendriks that ran for 18 months to conduct efficacy reviews (evidence for practice). This club included Cardiac and Stroke Researchers in the CFI, including those involved in the CHAP program along with support from JBI and Flinders librarians.

The team worked on 9 Systematic Reviews, with 5 directly relating to the CHAP project that will result in >20 related publications. At the end of June 2023, 2 systematic reviews have been published with 3 submitted for publication and the other 4 to be completed before the end of July 2023. Refer to <https://www.chaproject.com.au/sub-projects/systematic-review-club> for list of SR publications.



CHAP Model of Care (Implementation and prospective evaluation of the CHAP model of care: a study protocol, *BMJ Open*, <https://dx.doi.org/10.1136/bmjopen-2021-054558>)



## Stage 2 – Identify Local Barriers to CR Participation

It is well known from the literature that barriers to CR participation happen at multiple levels and can be related to patients, clinicians and system factors. Over the decade before CHAP, the team have identified four major barriers to CR participation. These include limited referrals, lack of person-centred approaches and options, lack of sustainable support to lifelong secondary prevention and heterogeneous quality among the programs.



Local barriers to cardiac rehabilitation participation

### • Barrier 1: Limited referrals to CR



A range of factors influence clinicians' view about CR. Our preliminary work showed that clinicians lacking cardiac qualifications may have limited knowledge and awareness of CR and its benefits. Low agreement among clinicians on patients who are more likely to benefit from CR, clinicians' personal lifestyle and health belief and the knowledge on the availability and quality of local CR programs also impact on referral to CR. The lack of standard administrative processes of referral and of reliable systems to support clinicians with these processes has also been identified as reason for limited referrals to CR. (Astley 2015; Astley 2020). To address this, iCCnet SA implemented the Country Access to Cardiac Health (CATCH) program. This program includes a central referral process that receives CR referrals for patients discharged from public and private hospitals and directs them to a face-to-face or telephone-based CR service depending on patient's preferences and proximity to a CR community centre (Tideman 2015).

### • Barrier 2: Lack of patient-centred approaches and individual choices



The CATCH program also implemented a telephone-based CR service that is offered to patients living at least 50 km away from a CR service. (Tideman 2015). The CATCH telephone program is aligned with findings from a systematic review conducted by members of our team that showed that individualised telehealth or home-based CR programs were effective alternative models that are comparable to the traditional hospital and community-based programs in terms of reducing

CVD risk factors (Clark 2015). These telehealth options are particularly important to Australians living in rural and remote areas where distances and lower availability of services amplify limitations to CR access (Clark 2009).

### • Barrier 3: Lack of sustainable lifelong commitment to secondary prevention supported by primary care



To address the barrier of the shortage of specialists in rural and remote areas throughout Australia, iCCnet developed a model of care (GP Hybrid network) that enables CR delivery through a strong collaboration among general practitioners (GPs), practice nurses working in rural and remote areas in SA and CR nurses working in the CATCH telephone-based service. This service has been evaluated and has shown high attendance and completion rates, and enhanced clinical outcomes for patients within 12 months, such as improved lipids and diabetes control (Clark 2019). All these measures of performance of the GP Hybrid network were enabled by the establishment of the CATCH database by iCCnet.

### • Barrier 4: Heterogeneous CR Quality



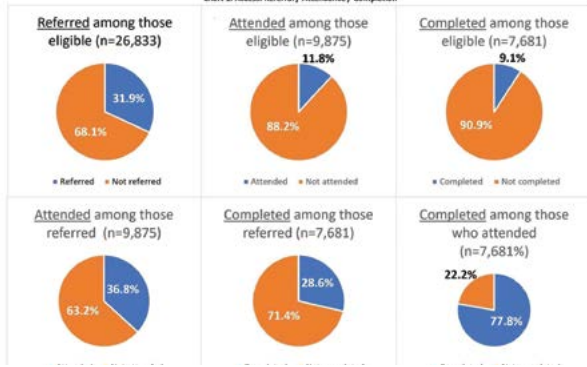
ACRA recommends five core components for quality delivery and outcomes of CR services—access to services, assessment and monitoring, recovery and longer-term maintenance lifestyle or behavioural changes, medication adherence, evaluation and quality improvement. National quality indicators for CR were established by ACRA and the National Heart Foundation of Australia in 2019 (Gallagher 2020). However, currently, there is no standardisation of the CR services and programs with only a few meeting minimum duration standards. Therefore, there is a large variation across services in terms of the content, measures, the number of sessions and length of the CR program.

## Stage 3 - Measure Performance

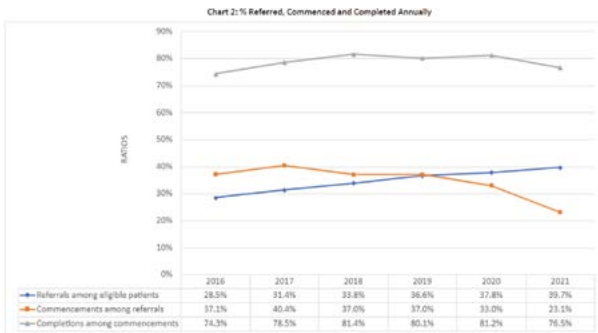
This CATCH dataset with standardised electronic data collection was used to audit and provide feedback to all public face-to-face services and the telephone-based service in the state of SA.

With the data from our first CATCH extract from 2016 to 2021 (prior to CATCH web), a State-wide snapshot for all CR services in SA was provided to services mid-February 2023. Based on this audit, we can see that the median wait time for referral to commencement of CR is 40 days based on 84,064 eligible patients. Due to the large amount of missing data during this period, a CR Outcomes Workshop was held in February 2023 for CR clinicians to discuss issues and develop strategies to improve data collection.

State-wide Cardiac Rehabilitation (CHAP) Dataset Audit Report of Quality Service Outcomes Data Entry: 2016-2021  
 Median wait time from referral to commencement of cardiac rehabilitation (2016-2021): days = 40 (IQR 23-75); No. of eligible patients = 84,064  
 Chart 1: Access: Referral / Attendance / Completion



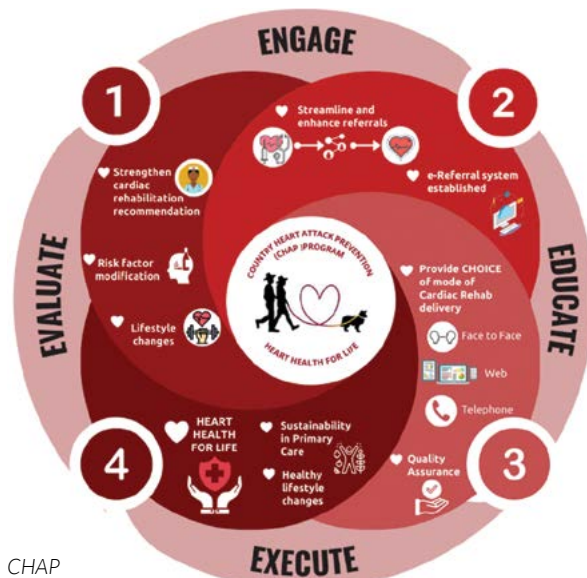
Access: Referral / Attendance / Completion



% Referred, Commenced and Completed Annually

### Stage 4 – Ensure all patients receive the CHAP Model of Care

The CHAP model of care is underpinned by a patient-centred approach. Patient-centred care or person-centred care is based on principles that those receiving healthcare must be treated with dignity and respect and be involved in all decisions about their health. This approach was applied in this study through involvement of patients in the codesign of the CR web program (ACSQHC 2012) and development of a model that allows patients to choose among different CR modes of delivery (face to face, telephone or web based, or combinations of these modes) ( Beleigoli 2022).



CHAP Four-Step Model

## 1. ENGAGE

The CHAP team engaged with patients, clinicians and managers through workshops and meetings to design and refine the CHAP model of care and support the development of resources. Engagement strategies included; a video wall of recommendation, social media, public seminars, showcases, representation on committees, partnerships and workshops.

### Recommend Video



A “recommend” video wall was developed in partnership with our community of doctors, nurses and patients who happily volunteered to make this humbling and passionate plea to the 70% of eligible patients who do not attend to go the CR as a united endorsement for the benefits of enrolling and attending a CR and secondary prevention program.

To view go to <https://www.youtube.com/watch?v=nw9Ekaumimg&t=28s>

### Social Media

A Twitter account was established in February 2020 to share outcomes and updates about the CHAP project @CHAPproject. We currently have over 650 followers who can see and share the successes of the project.

A YouTube channel was created in March 2022 to host the recording from our educational events at @chaproject7739 that contains over 30 public and hundreds of private videos that are hosted on our CR website.



**Over 650 Followers**  
@CHAPproject



**Over 30 Youtube videos**  
@chaproject7739



**Over 6000 Website views**  
chaproject.com.au



**22 CHAP Team Newsletters**



**Over 250 Newsletter subscribers**

## Public Seminars

Three public seminars were held to provide clinicians and the public with more information about key topics relating to CR.

### 22 July 2021 - Everything you have ever wanted to ask your Cardiologist and more

Guest Speaker: Dr Phil Tideman

To view go to <https://www.youtube.com/watch?v=LayAGgJ9sRY&t=3s>

### 15 October 2021 - Medications for people with cardiovascular conditions

Guest speakers: Mr Greg Roberts and Dr Lemlem Gebremichael

To view go to <https://www.youtube.com/watch?v=LN5-9qOej4&t=25s>

### 2 November 2022 - Unzipping the Taboo: undressing sexuality and intimacy as part of cardiac care

Main presenter: Prof Gary Wittert, Director SA Division, Freemasons Centre for Male Health & Wellbeing

To view go to <https://www.youtube.com/watch?v=oZ7us1aUbas&t=209s>



*The final public seminar attracted 26 participants with 54% completing the evaluation. 79% found this seminar very interesting including the panel discussion.*

## CHAP Showcases

Showcases were held every year to provide all investigators, clinicians and other stakeholders with details about CHAP project's achievements and outcomes.



Showcase held on 17 June 2022

To view recordings, go to [www.chaproject.com.au](http://www.chaproject.com.au)

## Representation on Committees

The CHAP team were actively involved in a number of Committees including:

- SA Statewide Rehabilitation & Secondary Prevention Coalition
- Statewide Cardiac Clinical Network
- ACRA local meetings
- Heart Foundation Guidelines Group
- Health Translation SA – Translation Flagship Program
- MTP Connect

## Partnerships



This video was developed to illustrate the important partnership we have with the Heart Foundation and shows our passionate mid and early career multi-disciplinary team of researchers in action.

To watch go to <https://www.youtube.com/watch?v=F-qGx8eS4iw>



We have also been working closely with Prof Sherry Grace from York University in Toronto to look at CR especially for women.



Her Heart came on board as a supporter for our heart health-related projects including Cardiac Rehabilitation Especially for Women (CREW).

## SALHN Department of Cardiology Clinical Grand Round

The CHAP Team was invited to present at the Southern Adelaide Local Health Network (SALHN) Department of Cardiology Grand Round on 20 August 2021 where the project was strongly endorsed as a priority area for clinical change management.

## Cardiac Rehabilitation Data Workshop



Following the completion of the audit completion of an audit of CR outcomes from the CATCH database for the period 2016-2022, the CHAP team in conjunction with Heart Foundation, Novartis, ACRA, HTSA and CFI convened a Statewide Workshop with all CR clinicians to discuss the context of national and international activities in this area. As an outcome of the workshop 6 recommendations for quality improvement measures were identified by CR Services (see Objective 4)..

This workshop titled ‘solutions for evaluation of the quality and outcomes of Cardiac Rehabilitation in South Australia’ was held on 24 February 2023, with 55.

55 participants involved (37 in person, 18 online).

**87% agreed that the workshop met their expectations personally and 91% professionally.**

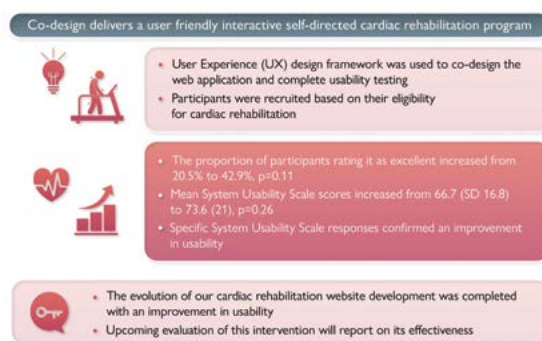
**96% agreed that the presentations were clear and informative.**

To view the recording, go to <https://www.chaproject.com.au/events/workshops/> and to see the 6 recommendations and solutions go to <https://www.chaproject.com.au/outcomes/data-recommendations>

## Co-Design ‘Roadshow’ Workshops

To expand the choices of CR modes of delivery, CHAP co-designed with patients living in rural areas a web-based program accessed through a personal log-in using the user experience (UX) design, an established codesign framework to guide the engagement with end users through workshops and the codesign process from concept design to completion.

6 co-design web development workshops and 6 usability testing workshops were held with 39 + 35 consumers (adults 18 years or older who were eligible for CR) from November 2020 to September 2021 in regional areas throughout the Local Health Network’s in SA including Whyalla, Mount Gambier, Wallaroo, Nuriootpa, Tanunda, Berri, Port Lincoln and Murray Bridge. These workshops were designed to get feedback on the CR website patient interface, usability and acceptability. The methodological approach and outcomes for this work are published in the European Journal of Cardiovascular Nursing <https://dx.doi.org/10.1093/eurjcn/zvab127>



Cardiac rehabilitation website co-design outcomes graphical abstract

These workshops were sponsored by Novartis





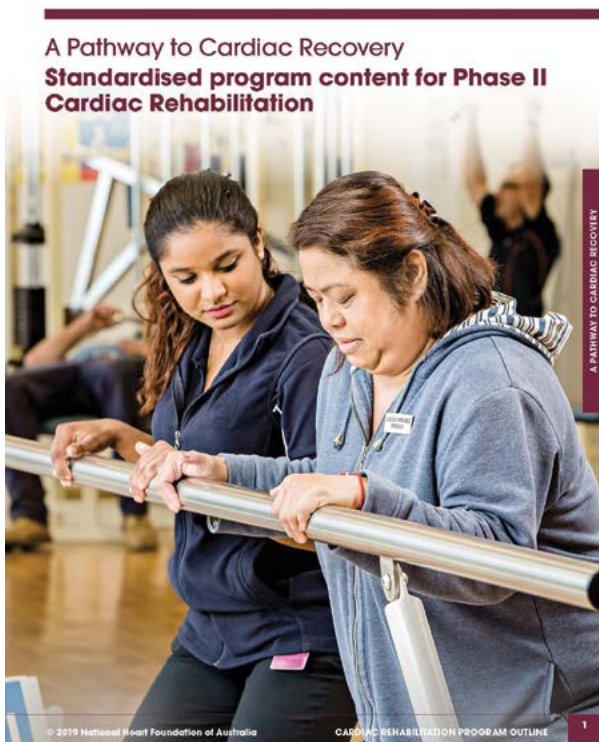
## 2. EDUCATE

To educate patients, clinicians and managers on the CHAP project including the use of the CR website, a procedure manual was developed providing hardcopy CR resources to clinicians. CPD sessions were also held regularly with guest speakers to provide further information with a focus on the 10 modules included in the CHAP manual and CR website.

### Procedure manual for standardises program delivery

The CHAP team created a manual for CR clinicians with resources (supplied by the Heart Foundation) to support patients through their CR journey, based on the National Heart Foundation of Australia and ACRA guidelines comprising of 10 evidence-based modules benchmarked to international standards (initial assessment and goal setting, heart education and self-management, exercise training and physical activity, healthy eating and weight management, tobacco cessation and alcohol reduction, medication education and review, managing medical risk factors, psychosocial well-being, activities of daily living, reassessment and completion), that were also embedded into the CR web.

Hard copy manuals were printed and posted to 23 services across rural and metro SA. Additional copies were proved to SA Health, the Rural Support Service, Primary Health Network and the Statewide Cardiac Clinical Network.



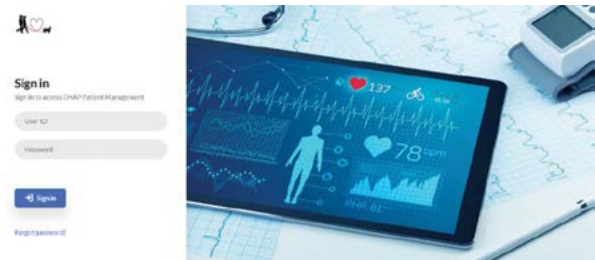
Heart Foundation's standardised program content for Phase II Cardiac Rehabilitation

## Cardiac Rehabilitation Online

To improve CR access for populations living in rural and remote areas, a web-based CR program was developed for regional and rural cardiac patients to access CR in their own homes, and in their own time. With the main aim of increasing attendance to and completion of CR, a co-designed, interactive, clinician led, web-based CR program was developed to increase flexibility and provide choices to patients.

The program was launched for regional local health network clinicians and patient use on 1 July 2021 in collaboration with iCCnet and their CATCH program.

A number of strategies in the education of both the web-based program and the use of it was applied. This included backup support from both the web-developer and the clinician researcher, self-help sheets, and a systematic induction process for eligible CR sites. The intensive induction process occurred July to August 2021, with ongoing inductions to staff as required. This process took one hour, via teams, with the procedure explained using a flow chart. We then used the web program itself, using a test patient, to step clinicians through the procedure for enrolling and setting up patients access and other functions to successfully use the program.



CR Web (Cardiac Rehabilitation online program)

*“I found this program to be very beneficial and would strongly recommend it to people having a heart operation”.*

- CR WEB USER

## Continuing Professional Development Program

Thanks to Dr Stephanie Champion who established and delivered the CPD program in 2020 and 2021 and Dr Joyce Ramos for delivering the events in 2022, a total of 29 Continuing Professional Development (CPD) sessions were held for CR clinicians from June 2020 to December 2022 addressing CR core components and assessment of the quality indicators. The majority of these have been recorded and uploaded to YouTube that can also be accessed through the CHAP website.

During 2021 and 2022, the sessions were aligned to 10 modules in the CR web program.

Throughout 2022, there were 10 sessions held with an average of 21+7 people attending each session, and average monthly views on YouTube for 2022 sessions recorded was 18± 13.

From the 44% of attendees who completed the evaluation:

**84% found the main speakers very interesting.**

**83% found the information from the sessions to likely have an impact on how they deliver care.**



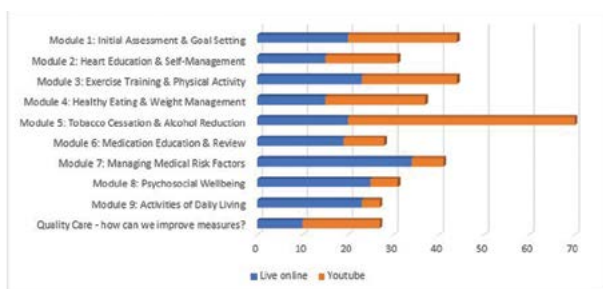
Modules included in CR web used as basis for CPD Program

## CHAP Website

The CHAP project's public facing website was used to provide details and updates about the project to engage clinicians in what we were doing through our regular newsletters and educational events. The site will continue to be available for another few years to remain a resource for the project. The website includes details about the project including the teams involved and the sub-projects, the monthly newsletters, links to recordings from the educational sessions and outcomes including links to the CHAP publications.



CHAP website - [www.chaproject.com.au](http://www.chaproject.com.au)



CPD Attendance (2022)

The format of the CPD sessions included a guest speaker on one of the modules following by a clinician from a CR service providing an update as part of the 'Service of the Month'. These monthly sessions became an informal community of practice with the CR clinician's sharing information about their service including location, staff, services and programs available, patient characteristics, impact of COVID-19 etc.

### 3. EXECUTE

To implement the CHAP model in rural and remote SA, a number of activities were undertaken including the development of a business model to support GPs to provide CR along with the development of statewide forms for patient satisfaction and hospital discharge to provide standardisation across SA.

#### E-referral

We planned to address the limited number of referrals by promoting CR endorsement among clinicians and providing them with an electronic system that facilitates referrals. This unfortunately was not able to be implemented due to the pandemic and will be recommended when the CHAP Model is implemented Statewide.

#### Heart Health for Life Business Model

To encourage more primary care providers to be formally involved in delivering CR and secondary prevention, a structured business model and value proposition for primary care providers to implement CR in their practice was developed. The Australian Medicare items were interrogated to identify additional support available for patients who cannot attend hospital or centre-based CR and can only access it through their general practice.

Utilising the Chronic Disease Care Planning Medicare items, GPs complete four clinical assessments at 1-2 weeks, 8-12 weeks, 6- and 12-months post-discharge. The net benefit to the general practice is up to \$1,148 per patient in phase 2 (post-discharge pre-exercise period) and \$1,160 in phase 3 (exercise and education program).

***GPs can claim benefits (using MBS items) to provide cardiac rehabilitation in practice.***



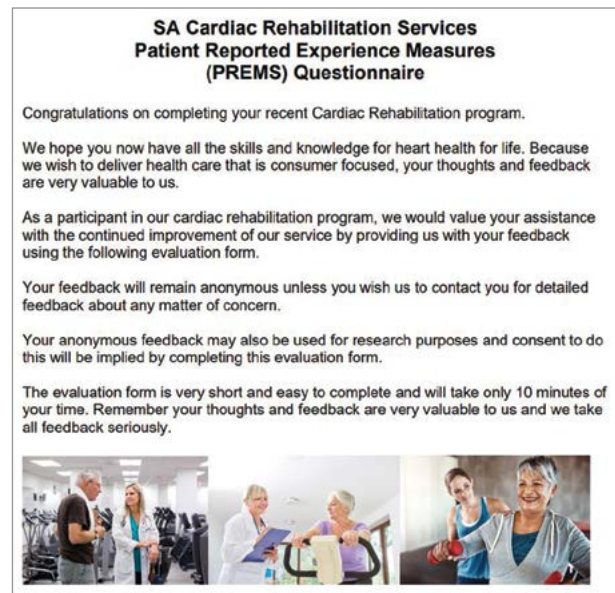
GP at centre of cardiac rehabilitation care

The number of rural GPs providing CR in partnership with the CATCH through the GP-hybrid model, increased from 28 in 2021 to 32 in 2022. This increase may be attributed to this value proposition. The biggest limitation is timely access to allied health services in the rural areas.

To support the role out of the Business model, two workshops were held with GPs at the Rural Doctors Association of South Australia (RDASA) Masterclass in August 2022 and virtually for the Rural Doctors Workforce Agency (RDWA) in October 2022.

To view the Business Model Report developed in collaboration with iCCnet SA and Brentnalls Health, go to <https://www.chaproject.com.au/sub-projects/business-model/>

#### Statewide Standardised Patient Reported Experience Measures



Statewide Standardised Satisfaction Form

The CHAP team collected Patient Reported Experience Measures (PREMS) forms from all CR Services in SA and with their feedback created a state-wide standardisation satisfaction form that has been created into an online survey using Qualtrics. The surveys were individualised for each CR Service to capture feedback from participants who have been involved in a CR program.

Copies of the PREMS form is available on the CHAP website at <https://www.chaproject.com.au/sub-projects/statewide-prems/>



## Statewide Standardised Discharge Form

A standardised discharge form has been created for SA with support from the SA Statewide Rehabilitation & Secondary Prevention Coalition and the Statewide Clinical Network. The standardised letter now includes a report on risk factor modification according to the international benchmarks and reports on the areas of ongoing focus for the primary care providers.

Copy of the discharge letter is available on the CHAP website at <https://www.chaproject.com.au/sub-projects/statewide-discharge-form/>

Phase Two Cardiac Rehabilitation		OFFICIAL		Completion Summary	
Organisation Name					
Patient/Client name					DOB
Diagnosis					
General Practitioner			Cardiologist		
Hospital Admission		Admission Date		Discharge Date	
CR Admission		Admission Date		Discharge Date	
CR Sessions Completed		<ul style="list-style-type: none"> <li>European Society of Cardiology standard-75%</li> <li>Australian standard-To complete the CR program a patient must have participated in at least some of the CR intervention components (guided by a health professional) and have had a documented re-assessment</li> </ul>			
Risk Factors	Enrolment to CR (Pre-Assessment)	Discharge from CR (Post-Assessment)	Improvement	International (ICHR), European (ESC), Australian (NH&M) Standards and Benchmarks	
Functional Capacity 6 Minute Walk Test (6MWT)				<ul style="list-style-type: none"> <li>≥25% improvement</li> <li>Can be measured remotely <a href="https://www.health.gov.au/health-topics/6-minute-walk-test">https://www.health.gov.au/health-topics/6-minute-walk-test</a></li> <li>For normal the mean 440±100m to 571±60m (range 200-750 m)</li> <li>Minimal important difference (MID) in distance is assumed at 20 m for chronic lung disease, 25 m for coronary artery disease, 25 m in heart failure and 25-30 m in pulmonary arterial hypertension.</li> </ul>	
Muscle Strength 30 sec sit-to-stand Or Hand Grip				<ul style="list-style-type: none"> <li>≥25% improvement</li> <li>scores ranging from 0 for those who cannot complete if stand to greater than 20 for more fit individuals</li> <li>Hand grip <a href="https://www.health.gov.au/health-topics/hand-grip-strength">hand grip strength</a> and BMI related (Range 20-25)</li> <li>Self-reported or measured</li> <li>100 minutes per week at discharge</li> </ul>	
Mean minutes of moderate to vigorous-intensity activity per week				<ul style="list-style-type: none"> <li>≥10% improvement</li> <li>RH22: a PHQ-2 score ranges from 0-6. The authors identified a score of 2 as the optimal cut-point when using the PHQ-2 to screen for depression.</li> <li>RH23: if the score is 3 or greater, major depressive disorder is likely. Total scores of 1, 2, 3, 4, 5, and 6 represent depressive, mild, moderate, moderately severe and severe depression, respectively.</li> <li>Note: Question 2 is a single screening question on suicide risk. A patient who answers yes to question 2 needs further assessment for suicide risk by an individual who is competent to assess the risk.</li> <li>GAD7: When screening for anxiety disorders, a score of 8 or greater represents a reasonable cut-point for identifying probable cases of generalized anxiety disorder. Further diagnostic assessment is recommended to determine the presence and type of anxiety disorder. Using a cut-off of 8 the GAD-7 has a sensitivity of 82% and specificity of 78% for diagnosed generalized anxiety disorder. The following cutoffs correlate with level of anxiety severity: Score 0-4: Minimal Anxiety, Score 5-9: Mild Anxiety, Score 10-14: Moderate Anxiety, Score greater than 15: Severe Anxiety.</li> </ul>	
Depression and Anxiety PHQ2					
PHQ9					
GAD7					
Quality of life score				<ul style="list-style-type: none"> <li>≥10% improvement</li> <li>SF-36PQOL: The maximum score of 8 indicates the best health status, by contrast with the scores of individual questions, where higher scores indicate more severe or frequent problems. In addition, there is a visual analogue scale (VAS) to indicate the patient's health status with 100 indicating the best health status.</li> </ul>	
Weight reduction Weight				<ul style="list-style-type: none"> <li>≥5% or weight loss</li> <li>Normal weight (BMI 18.5-24.9) or abdominal circumference &lt;94 cm in men and &lt;80cm in women;</li> <li>Overweight (BMI 25 and &lt;30 or abdominal circumference 94 and &lt;102 cm in men or 80 cm and &lt;88 cm in women) and</li> <li>Obese (BMI ≥30 or abdominal circumference ≥102 cm in men or ≥88 cm in women) patients.</li> </ul>	
Waist Circumference					
BMI					

Statewide Discharge Form

## Accreditation Program

An accreditation program was a key outcome requested by Michele McKinnon Director of Country Health SA, one of our significant partners in the project.

There has never been an accreditation service for benchmarking and evaluation of the quality of CR services.

From 2019 -2023 we explored international programs from the European Cardiac Society and the International Council of Cardiovascular Prevention and Rehabilitation (ICCP). The ICCPR program was determined as the most accessible and affordable to the CR Australian practice context.

In 2020, ACRA and the National Heart Foundation published 10 CR quality indicators (without benchmarks) to inform delivery of best practice service content. In 2021, one of our first steps to evaluate the CR quality of programs, the CHAP team assessed programs through the adherence to these quality indicator measurements.



<https://dx.doi.org/10.1186/s12913-022-07667-2>

A survey was undertaken with 23 CR programs in SA providing a baseline for CR service quality improvement initiatives. The survey identifying gaps in measurement of the quality indicators, including post-assessment, HRQOL, medication adherence and exercise capacity and that services did not have data to calculate rate of referral with median wait time being 27 days.

In 2023, the next phase of the process will be to achieve ICCPR Accreditation for the Northern Adelaide Local Health Network (NALHN), this will make the service the first internationally accredited service in Australia. The remaining 22 services will be involved in a pre-accreditation education process to implement the quality indicators into practice in preparation for the accreditation process.

Australian Cardiac Rehabilitation Quality Indicators Summary	
The below provides a summary of the 10 quality indicators for CR. Some indicators aim to evaluate processes of care (process indicators) while others evaluate the outcomes of CR (outcome indicators). These are colour co-ordinated as per the key below the figure.	
Q1-1. REFERRAL	Eligible in-patients are referred to cardiac rehabilitation within 3 calendar days of hospital discharge.
Q1-2. TIME TO ENROLMENT	Eligible in-patients commence cardiac rehabilitation within 28 calendar days after hospital discharge.
Q1-3. COMPREHENSIVE ASSESSMENT	Patients who commence CR receive a comprehensive assessment of cardiovascular risk factors.
Q1-4. DEPRESSION SCREENING	Patients who commence CR are screened for depression at initial and re-assessment and offered counselling (or a referral to counselling) if symptoms are identified.
Q1-5. ASSESSMENT OF SMOKING	Patients who commence CR are assessed for smoking use at initial assessment and offered smoking cessation counselling if they are a current or recent smoker.
Q1-6. ASSESSMENT OF MEDICATION ADHERENCE	Patients who commence CR are assessed for medication adherence at initial and re-assessment.
Q1-7. EXERCISE CAPACITY	Patients who commence CR have an initial assessment and re-assessment to determine exercise capacity change.
Q1-8. HEALTH-RELATED QUALITY OF LIFE	Patients who commence CR have an initial assessment and re-assessment to determine any change to health-related quality of life.
Q1-9. RE-ASSESSMENT	Patients who participate in CR receive a comprehensive re-assessment of their cardiovascular risk factors.
Q1-10. CARE TRANSITION	Patients and ongoing care providers are provided with a report which outlines patient risk factors and an individualised ongoing management plan.
■ Process indicator	■ Outcome indicator

ACRA and NHF Cardiac Rehabilitation Quality Indicators



## 4. EVALUATE

The evaluation of sub-projects included impact of COVID on country CR Services, PREMS, evidence-based pharmacotherapy, clinical outcomes, health economic outcomes and clinical outcomes for those who used the web based program.

### Impact of COVID on Rehab Services

To understand the impact of COVID-19 on clinical outcomes and health service utilisation of patients referred to CR in SA and to be able to inform clinicians and managers to better prepare the service for potential future outbreaks, a study was undertaken to undertake the following objectives:

1. To compare 3-month clinical outcomes of patients living in areas covered by SA referred to CATCH
2. To compare utilisation of the CATCH during COVID-19 situation to pre-COVID-19 SA
3. To understand the views of clinicians on the impact of COVID-19 on provision and on their decision-making processes regarding management and delivery of CR for patients in SA

Results:

- 13 clinicians from each of the 15 sites (14 rural clinics and the CATCH service) were invited to participate in a qualitative survey.
- Ten responses were received with representation from each of the six LHN areas.
- Most, 70%, of services reported COVID-19 had not impacted their work arrangements but half the services reported an important impact on their ability to assess CR risk/benefit for patients due to the cancellation of face to face group services and switch to telehealth approach.
- The greatest impact on services was the cancellation of exercise programs (90%).
- All services cancelled their face to face sessions during COVID and 9 of 10 offered telehealth options instead.

### CR Web-based Program Outcomes

The outcomes of this implementation process were measured using the RE-AIM framework for implementation studies.

Preliminary results at 30 June 2023 reported : a total of 1,433 rural and remote patients participated in either a traditional or an interactive web-based mode of delivery for their CR program, with 50 choosing the web-based program between 1 July 2021 to 30 June 2022 with 34% completing the online program.

The mean age of patients using the web program was 60 years with 17 (34%) being female. Myocardial infarction was the predominant reason for referral. People using web were significantly younger than those in the other modes of delivery. There was no difference in gender distribution between web and non-web.

### Patient Reported Experience Measures Outcomes

Patients reported very positive experiences and feedback for the modes of the delivery during and after the CHAP model of care (face to face (country and metro) 95.9%, telephone 93.9% and web 77.8%) with an overall very high satisfaction score of 83%.

Patient feedback on Telephone CR service:

*The only thing that I would suggest would be to have more sessions.*

*Contact a bit sooner following discharge however was not a huge issue.*

*Nurse was positive knowledgeable, friendly and appeared interested. Made me feel that I wasn't just a number - well done!*

## Evidence Based Pharmacotherapy

Evidence based pharmacotherapy were collected and analysed from 1,229 participants who were  $\geq 18$  years of age, discharged from hospital with Acute Coronary Syndrome (ACS), with records of medication details in their discharge summary, and participated in CR programs in 2018 and 2019.

Prescriptions of evidence-based pharmacotherapy was assessed using the Australian guideline 2016. Prescriptions of the four recommended classes of medications (antiplatelets, statin, beta blockers and angiotensin converting enzyme inhibitors or angiotensin receptor blocker) was considered optimal evidence-based pharmacotherapy.

Of the 1,229 patients, only 39.7% of patients received optimal prescription. Those patients prescribed evidence-based pharmacotherapy had been admitted to hospital less than those not prescribed with statistically significant difference. It also shows that the likelihood of prescribing recommended medications in women with ACS is lower than their men counterparts.

***Only 39.7% of patients in this cohort were receiving evidence based pharmacotherapy.***

These findings present prescribers with great opportunity to follow guideline recommendations in clinical practice that can reduce hospital admission of ACS patients before they attend their CR programs.



Thanks to AstraZeneca for sponsoring Dr Lemlem Gebremichael's postdoctoral fellowship to undertake this work.

## OBJECTIVE 2: EVALUATE THE CLINICAL EFFECTIVENESS OF CHAP

Key to both sustainability of the CHAP model and its ability to influence health policy and practice is the development of evidence demonstrating its clinical effectiveness.

There were 15,766 eligible cardiovascular separations retrieved from the Admitted Patient Care database from 01/07/2021 to 30/06/2022 and linked to the CATCH database. Among those, 4,915 (31.1%) were referred to CR via the CATCH central referral system. These participants comprise the population of this study with 2,853 being exposed to the CHAP model of care and 2,062 not being exposed. The metropolitan hospitals were the main source of referral for both CHAP and non-CHAP.

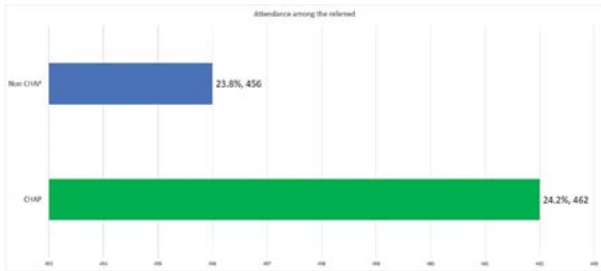
The mean age of the population was 70.1 years. Patients exposed to CHAP were older and had a lower Index of Socioeconomic Advantage and Disadvantage (IRSAD). The proportion of women was similar between CHAP and non-CHAP and lower than men's across all age groups. Whilst 97.5% of the non-CHAP group lived in major cities, 80% of the CHAP participants lived in outer and inner regional areas.

Acute Coronary Syndrome (ACS) and revascularization procedures (CABG/PCI) were the main reasons for referral in both CHAP and non-CHAP, but referrals for heart failure and arrhythmia management were more common in CHAP. Most (63%) of the participants in the CHAP group and all in the non-CHAP group were enrolled in hospital or community-based centres.

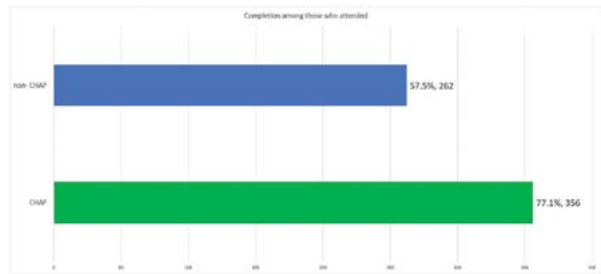
### Primary outcomes

The clinical effectiveness analysis was based on a cohort of 1,913 patients referred to CHAP and matched by age, sex and DRG to 1,913 patients not referred to CHAP (1:1 ratio). Attendance rates among those referred (24.2 versus 23.8%;  $p < 0.001$ ) and completion rates among those commencing the program (77.1 versus 57.5%;  $p < 0.001$ ) were higher in CHAP than in non-CHAP group.

After adjustment for sociodemographic and clinical variables, being enrolled in CHAP was associated with 1.08 (95%CI 1.01-1.15) times higher chances of attending a program and 1.15 (95%CI 1.06-1.24) times higher chance of completing a program. Attendance rates varied across the modes of delivery offered in CHAP with GP Hybrid (nurse-led telephone program with face-to-face support with the GP) being the one with the highest attendance (100%) followed by CATCH telephone (92.2%), centre-based (88.9%) and web-based (50%) programs.



Attendance among patients referred



Completion among patients who attended

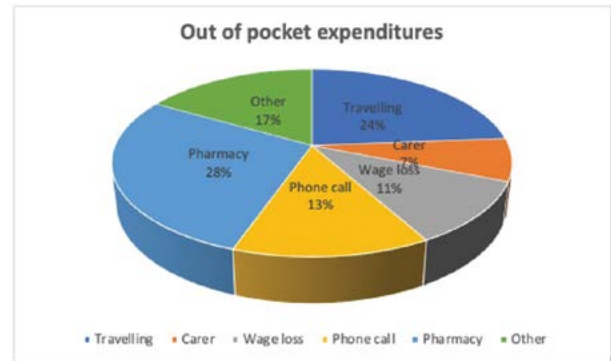
Final results are planned to be submitted to Implementation Science:

Belegoli, A., L. Gebremichael, K. Nesbitt, J. Foote, N. Bulamu, J. Ramos, S. Powell, S.J. Nicholls, A. Brown, D.P. Chew, J. Beltrame, A. Maeder, C. Maher, V.L. Versace, J.M. Hendriks, P. Tideman, B. Kaambwa, C. Zeitz, I.J. Prichard, R. Tavella, R. Tirimacco, W. Keech, M. Ludlow, K. Wanguhu, H. Meyer, C. Bester, R.A. Clark, and on behalf of the NHMRC CHAP Partnership Project Team. **“The impact of a model of care translating cardiac rehabilitation into practice in rural and remote Australia on health service utilisation, clinical outcomes and cost-effectiveness: results of the Country Heart Attack Prevention Project.”** *Implementation Science*

### OBJECTIVE 3: EVALUATE THE COST EFFECTIVENESS OF THE CHAP

The CHAP Model of care had a more than 50% chance of being cost-effective compared to no CHAP if at least \$1,000 was spent on each patient to ensure attendance at a CR facility.

Rural and remote patients average out of pocket costs was \$131.40. Other costs included gap fees for tests and GP visits.



*“On discharge after having a heart attack, I was told to go home and look after myself. Whilst I was in hospital, it would have been good to hear from someone regarding next steps / options. It is great to now know that there is a cardiac rehabilitation website that can be used to go through at your own pace, especially whilst waiting to get into a face-to-face cardiac rehabilitation program”.*

- CLAYTON BESTER, CONSUMER

## OBJECTIVE 4: IMPLEMENT A SUSTAINABLE MODEL OF CARE BEYOND THE CHAP TRANSLATION PROJECT

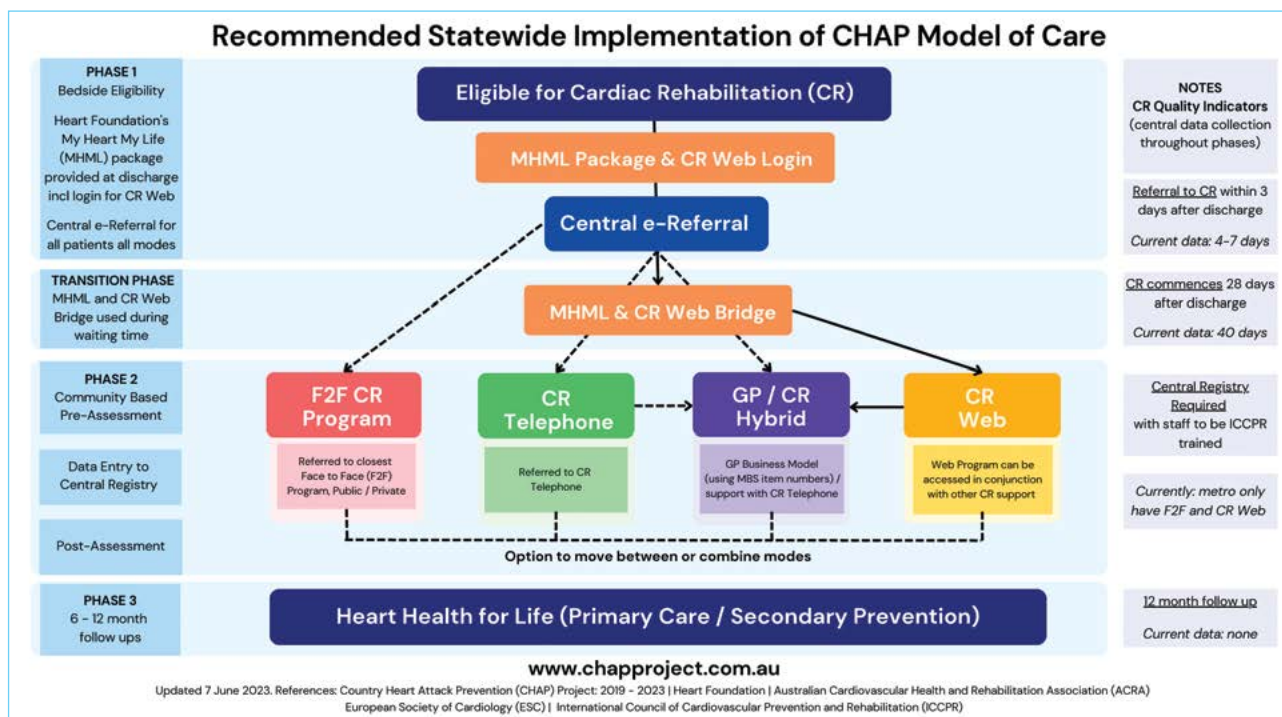
On request from the Statewide Cardiac Clinical Network, the CHAP team in conjunction with the SA Statewide Rehabilitation & Secondary Prevention Coalition developed a recommendation for a statewide implementation of CR care. This is the ultimate outcome for any implementation project and the success of the translation of CR evidence into practice.

Translation of the CHAP Model into practice recommendations included:

- Address the 6 key recommendations determined by the CR community of practice, ACRA and the CR Coalition. These include:
  1. Leadership
  2. Re-design of quality improvement data collection and reporting
  3. Review of Funding
  4. Address Waiting Times
  5. Improve referral systems
  6. Inclusive programs.

- Develop a business model for statewide translation of the CHAP model of care with a focus on the impact of workload with increased patient referral and participation.
- Recommend the ICCPR Registry as the statewide system for quality evaluation of CR program outcomes. Incorporate linkage to the EMR for clinical outcomes.
- Work with Primary Health Care Networks to design a data system that can easily integrate long-term follow-up (6 and 12 months) clinical and lifestyle change outcomes.
- Establish a project to achieve International Accreditation for all 23 SA CR programs and as part of Accreditation ensure all clinical CR providers achieve ICCPR Accreditation.

Achievement of statewide translation into practice, will ensure SA will be the leader in the delivery of the highest quality evidence based CR and secondary prevention delivered by highly trained clinical professionals.



CHAP Model of Care for Statewide Implementation



*We have been overwhelmed with the amount of great outcomes from this project in such a short amount of time, especially the number of papers that have been published and the number of conferences we have been involved in to share the results of this project. Some really great resources have been developed, grants have been successful for sub-projects and lots of team recognition and awards have been won.*



# Project Outcomes

## Summary of outcomes:



**37 Publications/Papers**



**62 Presentations**



**29 CPD Sessions**



**12 Co-design 'Roadshow' Workshops**



**6 Successful Grants**



**4 Post Doctoral Fellowships**



**2 PhD Students Recruited**



**7 Awards**

## 37 CHAP PUBLICATIONS / PAPERS

### 24 Published Papers

24 papers have been published in National and International Journals.

1. Bulamu, N., C. Mpundu-Kaambwa, L. Gebremichael, M.A. Pinero de Plaza, H. Dafny, S. Hines, A. Beleigoli, J. Hendriks, B. Kaambwa, R.A. Clark, and on behalf of the NHMRC CHAP Partnership Project Team. **"Measurement Properties of Utility-Based Quality of Life Measures Used in Cardiac Rehabilitation: A Systematic Review Protocol."** *JBI Evidence Synthesis*. (Accepted)
2. Suebkinorn, O., J. Ramos, S. Grace, L. Gebremichael, N. Bulamu, M.A. Pinero de Plaza, H. Dafny, V. Pearson, S. Hines, L. Dalleck, J. Coombes, J. Hendriks, R.A. Clark, A. Beleigoli, and on behalf of the NHMRC CHAP Partnership Project Team. **"Effectiveness of alternative versus traditional forms of exercise on cardiac rehabilitation program utilization in women with or at high risk of cardiovascular disease: A systematic review protocol."** *JBI Evidence Synthesis* (Accepted).
3. Nesbitt, K., A. Beleigoli, S. Champion, L.G. Gebremichael, N. Bulamu, H. Du, R. Tirimacco, R.A. Clark, and on behalf of the NHMRC CHAP Partnership Project Team, **"Development and evaluation of a co-designed website for delivering interactive self-directed cardiac rehabilitation"**. *European Journal of Cardiovascular Nursing*, zvad026, (17 Feb 2023). <https://doi.org/10.1093/eurjcn/zvad026>



<https://doi.org/10.1093/eurjcn/zvad026>

4. Dafny, H., S. Champion, L. Gebremichael, V. Pearson, J. Hendriks, R.A. Clark, M.A. Pinero de Plaza, A. Gulyani, S. Hines, A. Beilegoli. **“Cardiac rehabilitation, physical activity, and the effectiveness of activity monitoring devices on cardiovascular patients: an umbrella review of systematic reviews”**. *European Heart Journal - Quality of Care and Clinical Outcomes*, qcad005 (23 Jan 2023). <https://doi.org/10.1093/ehjqcco/qcad005>

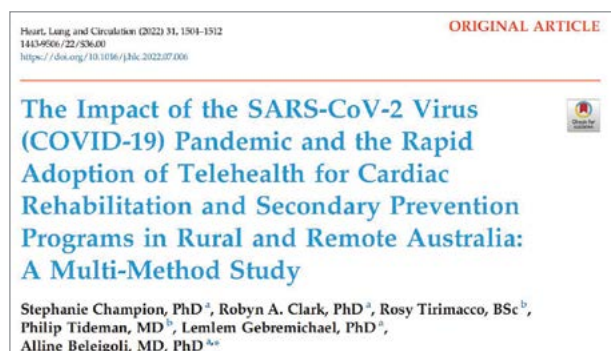


<https://doi.org/10.1093/ehjqcco/qcad005>

5. Dafny, H., S. Champion, L. Gebremichael, V. Pearson, K. Nesbitt, M.A. Pinero de Plaza, L. Bulto, S. Noonan, S. Hines, J. Hendriks, R.A. Clark, and A. Beilegoli. **“Effectiveness of Activity-Monitoring Devices in Patients with Cardiovascular Disease Participating in Cardiac Rehabilitation Programs: An Umbrella Review Protocol.”** *JBI Evidence Synthesis* 20(11):p 2806-2814, November 2022. <https://doi.org/10.11124/JBIES-22-00011>

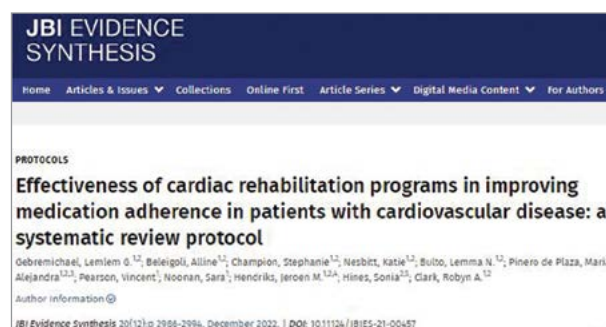
6. Suebkinorn, O., J. Ramos, S. Grace, L. Gebremichael, N. Bulamu, M.A. Pinero de Plaza, H. Dafny, V. Pearson, S. Hines, L. Dalleck, J. Coombes, J. Hendriks, R.A. Clark, and A. Beilegoli. **“Effectiveness of alternative versus traditional forms of exercise on cardiac rehabilitation program utilization in women with or at high risk of cardiovascular disease: A systematic review protocol.”** *PROSPERO* (3 Sept 2022). [https://www.crd.york.ac.uk/prospéro/display\\_record.php?RecordID=354996](https://www.crd.york.ac.uk/prospéro/display_record.php?RecordID=354996)

7. Champion, S., R.A. Clark, R. Tirimacco, P. Tideman, L. Gebremichael, and A. Beilegoli. **“The Impact of the SARS-COV-2 Virus (COVID-19) Pandemic and the Rapid Adoption of Telehealth for Cardiac Rehabilitation and Secondary Prevention Programs in Rural and Remote Australia: A Multi-Method Study.”** *Heart, Lung and Circulation* (17 Aug 2022). <https://dx.doi.org/doi.org/10.1016/j.hlc.2022.07.006>



<https://dx.doi.org/doi.org/10.1016/j.hlc.2022.07.006>

8. Gebremichael, L., A. Beilegoli, S. Champion, K. Nesbitt, L. Bulto, M.A. Pinero de Plaza, V. Pearson, S. Noonan, J. Hendriks, R.A. Clark. **“Effectiveness of Cardiac Rehabilitation Programs in Improving Medication Adherence in Patients with Cardiovascular Disease: A Systematic Review Protocol.”** *JBI Evidence Synthesis*. (11 Jul 2022). <https://doi.org/10.11124/JBIES-21-00457>

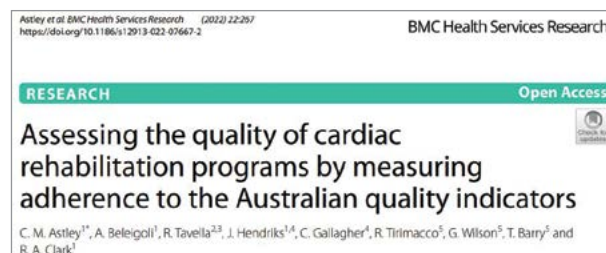


<https://doi.org/10.11124/JBIES-21-00457>

9. Bulamu, N., C. Mpundu-Kaambwa, L. Gebremichael, M.A. Pinero de Plaza, H. Dafny, S. Hines, A. Beilegoli, B. Kaambwa, R.A. Clark. **“Psychometric Properties of Utility-Based Quality of Life Measures Used in Cardiac Rehabilitation: A Systematic Review Protocol.”** *PROSPERO* (27 Jul 2022). [https://www.crd.york.ac.uk/prospéro/display\\_record.php?RecordID=349395](https://www.crd.york.ac.uk/prospéro/display_record.php?RecordID=349395)

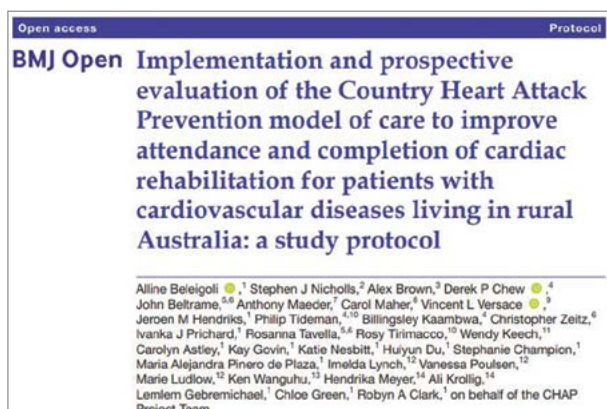
10. Nesbitt, K., A. Beilegoli, H. Du, R. Tirimacco, R.A. Clark. **“User Experience (UX) Design as a Co-Design Methodology: Lessons Learned During the Development of a Web-Based Portal for Cardiac Rehabilitation.”** *Eur J Cardiovasc Nurs* 21, no. 2 (3 Mar 2022): 178-83. <https://dx.doi.org/10.1093/eurjcn/zvab127>

11. Astley, C.M., A. Beilegoli, R. Tavella, J. Hendriks, C. Gallagher, R. Tirimacco, G. Wilson, T. Barry, R.A. Clark. **“Assessing the Quality of Cardiac Rehabilitation Programs by Measuring Adherence to the Australian Quality Indicators.”** *BMC Health Serv Res* 22, no. 1 (28 Feb 2022): 267. <https://dx.doi.org/10.1186/s12913-022-07667-2>



<https://dx.doi.org/10.1186/s12913-022-07667-2>

12. Belegoli, A., S.J. Nicholls, A. Brown, D.P. Chew, J. Beltrame, A. Maeder, C. Maher, V.L. Versace, J. Hendriks, P. Tideman, B. Kaambwa, C. Zeitz, I.J. Prichard, R. Tavella, R. Tirimacco, W. Keech, C. Astley, K. Govin, K. Nesbitt, H. Du, S. Champion, M.A. Pinero de Plaza, I. Lynch, V. Poulsen, M. Ludlow, K. Wanguhu, H. Meyer, A. Krollig, L. Gebremichael, C. Green, R.A. Clark, and on behalf of the NHMRC CHAP Partnership Project Team. **“Implementation and Prospective Evaluation of the Country Heart Attack Prevention Model of Care to Improve Attendance and Completion of Cardiac Rehabilitation for Patients with Cardiovascular Diseases Living in Rural Australia: A Study Protocol.”** *BMJ Open* 12, no. 2 (16 Feb 2022): e054558. <https://dx.doi.org/10.1136/bmjopen-2021-054558>.



<https://dx.doi.org/10.1136/bmjopen-2021-054558>.

13. Dafny, H., S. Champion, L. Gebremichael, V. Pearson, K. Nesbitt, M.A. Pinero de Plaza, L. Bulto, S. Noonan, S. Hines, J. Hendriks, R.A. Clark, and A. Belegoli. **“Effectiveness of Using Activity Monitoring Devices and Mobile Applications Versus Standard Care on Physical Activity and Health Outcomes of Patients with Cardiovascular Disease Participating in Cardiac Rehabilitation Programs: An Umbrella Review.”** *PROSPERO* (10 Jan 2022). [https://www.crd.york.ac.uk/prospero/display\\_record.php?ID=CRD42022298877](https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42022298877)
14. Nesbitt, K., A. Belegoli, H. Du, R. Tirimacco, R.A. Clark. **“Web-Based Cardiac Rehabilitation: A Co-Design Workshop.”** *Telehealth Innovations in Remote Healthcare Services Delivery* IOS Press: vol. 277, pp. 96-105 (2021). <https://dx.doi.org/doi:10.3233/SHT1210032>.

15. Belegoli, A., S. Champion, R. Tirimacco, K. Nesbitt, P. Tideman, R.A. Clark, and on behalf of the NHMRC CHAP Partnership Project Team. **“A Co-Designed Telehealth-Based Model of Care to Improve Attendance and Completion to Cardiac Rehabilitation of Rural and Remote Australians: The Country Heart Attack Prevention (CHAP) Project.”** *J Telemed Telecare* 27, no. 10 (1 Dec 2021): 685-90. <https://dx.doi.org/10.1177/1357633x211048400>.



<https://dx.doi.org/10.1177/1357633x211048400>

16. Nesbitt, K., L. Gebremichael, M.A. Pinero de Plaza, A. Belegoli. **“Effectiveness of Interactive Cardiac Rehabilitation Web-Applications on Program Adherence Rates in Patients with Cardiovascular Disease: A Systematic Review Protocol.”** *PROSPERO* (1 Nov 2021). [https://www.crd.york.ac.uk/prospero/display\\_record.php?%20ID=CRD42021288690](https://www.crd.york.ac.uk/prospero/display_record.php?%20ID=CRD42021288690)
17. Nesbitt, K., A. Belegoli, S. Champion, H. Du, R.A. Clark, R. Tirimacco, and on behalf of the NHMRC CHAP Partnership Project Team. **“Co-Designing Digital Cardiac Rehabilitation with Patients Living in Rural and Remote Australia - the Country Heart Attack (CHAP) Prevention Project.”** *European Heart Journal*, Volume 42, Issue Supplement\_1, October 2021, ehab724.3125 (14 Oct 2021). <https://doi.org/10.1093/eurheartj/ehab724.3125>
18. Gebremichael, L., A. Belegoli, S. Champion, K. Nesbitt, L. Bulto, M.A. Pinero de Plaza, V. Pearson, S. Noonan, J. Hendriks, R.A. Clark. **“Effectiveness of Cardiac Rehabilitation Programs Vs Standard Care on Medication Adherence in Eligible Cardiovascular Disease Patients: A Systematic Review Protocol.”** *PROSPERO* (12 Oct 2021). [https://www.crd.york.ac.uk/prospero/display\\_record.php?ID=CRD42021284705](https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42021284705)
19. Nesbitt, K., A. Belegoli, H. Du, R.A. Clark, R. Tirimacco. **“Web-Based Cardiac Rehabilitation: A Co-Design Experience with Patients Living in Rural and Remote South Australia in the Country Heart Attack (CHAP) Prevention Project.”** *Heart, Lung and Circulation* Volume 30, Supplement 3, 2021, Page S285 (30 Jul 2021). <https://doi.org/10.1016/j.hlc.2021.06.424>



20. Beleigoli, A., S. Champion, R. Tirimacco, K. Govin, P. Tideman, R.A. Clark. **"How the COVID Pandemic Affected Utilisation of Cardiac Rehabilitation in Rural Australia?"**, *European Journal of Cardiovascular Nursing* Volume 20, Issue Supplement\_1 (29 Jul 2021). <https://dx.doi.org/10.1093/eurjcn/zvab060.070>
21. Astley, C., R.A. Clark, S. Cartledge, A. Beleigoli, H. Du, C. Gallagher, S. Millington, J. Hendriks. **"Remote Cardiac Rehabilitation Services and the Digital Divide: Implications for Elderly Populations During the Covid19 Pandemic."** *Eur J Cardiovasc Nurs* 20, no. 6 (31 May 2021): 521-23. <https://dx.doi.org/10.1093/eurjcn/zvab034>
22. Nesbitt, K., D. Huiyun, P. Nolan, S. Cartledge, P. Wonggom, R.A. Clark. **"The Relationship between Health Literacy and Self-Care in Patients with Heart Failure."** *British Journal of Cardiac Nursing* Vol. 16, No. 3 (27 Mar 2021). <https://doi.org/10.12968/bjca.2020.0128>



<https://doi.org/10.12968/bjca.2020.0128>

23. Beleigoli, A., S. Champion, R. Tirimacco, K. Govin, P. Tideman, R.A. Clark. **"COVID Reduced Attendance and Completion of CR Programs in Rural and Remote Australia."** *Heart, Lung and Circulation* VOLUME 30, SUPPLEMENT 3, S278 (1 Jan 2021). <https://doi.org/10.1016/j.hlc.2021.06.407>
24. Astley, C.M., D.P. Chew, W. Keech, S. Nicholls, J. Beltrame, M. Horsfall, R. Tavella, R. Tirimacco, R.A. Clark. **"The Impact of Cardiac Rehabilitation and Secondary Prevention Programs on 12-Month Clinical Outcomes: A Linked Data Analysis."** *Heart, Lung and Circulation* 29, no. 3 (27 Feb 2020): 475-82. <https://doi.org/10.1016/j.hlc.2019.03.015>

## 4 Papers Submitted

4 papers have been submitted that are currently under review.

25. Gebremichael, L., S. Champion, K. Nesbitt, V. Pearson, N. Bulamu, H. Dafny, S. Sajeev, M.A. Pinero de Plaza, J. Ramos, O. Suebkinorn, A. Gulyani, L. Bulto, A. Beleigoli, J. Hendriks, S. Hines, R.A. Clark, and on behalf of the NHMRC CHAP Partnership Project Team. **"Effectiveness of Cardiac Rehabilitation Programs on Medication Adherence in patients with Cardiovascular Disease: A Systematic Review and Meta-Analysis."** *International Journal of Cardiology: Cardiovascular Risk and Prevention*. (May 2023)
26. Gebremichael, L., A. Beleigoli, J. Foote, N. Bulamu, J. Ramos, O. Suebkinorn, J. Redfern, R.A. Clark, and on behalf of the NHMRC CHAP Partnership Project Team. **"Missed opportunity: evidence-based pharmacotherapy and clinical outcomes of patients discharged with acute coronary syndrome who attended cardiac rehabilitation programs: a clinical linkage study"**. *MJA* (May 2023).
27. Beleigoli A., J. Foote, L.G. Gebremichael, N.B. Bulamu, C. Astley, W. Keech, R. Tavella, A. Gulyani, K. Nesbitt, M.A. Pinero de Plaza, J. Ramos, M. Ludlow, J. Bennetts, P. Tideman, S.J. Nicholls, D.P. Chew, J. Beltrame, R.A. Clark, and on behalf of the NHMRC CHAP Partnership Project Team. **"Clinical effectiveness and utilization of cardiac rehabilitation after hospital discharge: data linkage analysis of 84064 separations and quality improvement audit"**. *Eur J Prev Card* (Mar 2023).
28. Bulamu, N.B., A. Beleigoli, D. Heydon, K. Wanguhu, L.G. Gebremichael, S.Powell, B. Kaambwa, P. Tideman, R.A. Clark, and on behalf of the NHMRC CHAP Partnership Project Team. **"An Innovative Business model using established Medicare items for delivery of cardiac rehabilitation – a value proposition for primary care"**. *Aust Journal of GP* (Mar 2023).

## 9 Papers in Development

9 papers are being finalised to be submitted before 30 June 2023.

29. Beleigoli, A., H. Dafny, M.A. Pinero de Plaza, C. Hutchinson C, T. Marin, J. Ramos, O. Suebkinorn, L.G. Gebremichael, N.B. Bulamu, R. Tirimacco, W. Keech, M. Ludlow, J. Hendriks, P. Tideman, V. Versace, R.A. Clark, A. Beleigoli, and on behalf of the NHMRC CHAP Partnership Project Team. **“Cardiac rehabilitation utilization, clinical effectiveness, and barriers to completion among patients of low socioeconomic status living in rural areas: a mixed-methods study”**. *Eur J Prev Card*.
30. Suebkinorn, O., J. Ramos, S. Grace, L. Gebremichael, N. Bulamu, M.A. Pinero de Plaza, H. Dafny, S. Hines, L. Dalleck, J. Coombes, J. Hendriks, R.A. Clark, and A. Beleigoli. and on behalf of the NHMRC CHAP Partnership Project Team. **“Effectiveness of alternative versus traditional forms of exercise on cardiac rehabilitation program utilization in women with or at high risk of cardiovascular disease: A systematic review protocol”**. *Eur J Prev Card*.
31. Bulamu, N., C. Mpundu-Kaambwa, L. Gebremichael, M.A. Pinero de Plaza, H. Dafny, S. Hines, A. Beleigoli, B. Kaambwa, and R.A. Clark, and on behalf of the NHMRC CHAP Partnership Project Team **“Measurement Properties of Utility-Based Quality of Life Measures Used in Cardiac Rehabilitation: A Systematic Review”** *Quality of Life Research*.
32. Nesbitt, K, S. Champion, L. Gebremichael, J. Foote, R.A. Clark and A. Beleigoli, and on behalf of the NHMRC CHAP Partnership Project Team. **“Evaluation of a clinically integrated interactive web-based CR program”**. *Eur J Prev Card*.
33. Gebremichael, L., A. Beleigoli, R. Gallagher, J. Finan, R. Tirimacco, P. Tideman, R.A. Clark and on behalf of the NHMRC CHAP Partnership Project Team. **“How satisfied are South Australian consumers of cardiac rehabilitation programs?”** *British Journal of Cardiac Nursing*.
34. Beleigoli, A., L. Gebremichael, K. Nesbitt, J. Foote, N. Bulamu, J. Ramos, S. Powell, S.J. Nicholls, A. Brown, D.P. Chew, J. Beltrame, A. Maeder, C. Maher, V.L. Versace, J.M. Hendriks, P. Tideman, B. Kaambwa, C. Zeitz, I.J. Prichard, R. Tavella, R. Tirimacco, W. Keech, M. Ludlow, K. Wanguhu, H. Meyer, C. Bester, R.A. Clark, and on behalf of the NHMRC CHAP Partnership Project Team. **“The impact of a model of care translating cardiac rehabilitation into practice in rural and remote Australia on health service utilisation, clinical outcomes and cost-effectiveness: results of the Country Heart Attack Prevention Project.”** *Implementation Science*.
35. Bulamu, N., A. Beleigoli, L. Gebremichael, S.Powell, B. Kaambwa, R.A. Clark and on behalf of the NHMRC CHAP Partnership Project Team. **“Cost-effectiveness and Budget impact analysis of cardiac rehabilitation model of a web-based cardiac rehabilitation model of care for patients in rural and remote areas”**. *Eur J Prev Card*.
36. Nesbitt, K., S. Champion, V. Pearson, L. Gebremichael, H. Dafy, J. Ramos, O. Suebkinorn, M.A. Pinero de Plaza, S. Noonan, H. Du, J. Hendriks, S. Hines, A. Guylani, R.A. Clark and A Beleigoli, and on behalf of the NHMRC CHAP Partnership Project Team. **Effectiveness of Interactive Cardiac Rehabilitation Web-Applications on Program Adherence Rates in Patients with Cardiovascular Disease: A Systematic Review**. *Journal of Telemedicine and Telecare*.
37. Dafny H.A., Hutchinson C., Pinero de Plaza M.A., Ramos J., Keech W., Gebremichael L.G., Ludlow M., Versace V., Clark R.A., Beleigoli A. and on behalf of the NHMRC CHAP Partnership Project Team. **“Understanding inputs and patient reported outcomes of cardiac rehabilitation for patients with cardiovascular diseases living in areas of low socioeconomic status: a Social Return on Investment Analysis”**. *Eur J Card Nursing*.

**“Cardiac rehabilitation is not the end of road, need to look at secondary prevention and chronic disease management for long term care”.**

- DR PHIL TIDEMAN

## 62 CONFERENCE PRESENTATIONS

### 50 Conference Presentations (to 30 June 2023)

The team have presented CHAP outcomes at 50 national and International conferences all around the world with the majority of presentations being held virtually in 2020 and 2021 due to the pandemic and then face to face in 2022 and 2023.

1. Beleigoli, A., L. Gebremichael, N. Bulamu, J. Ramos, O. Suebkinorn, K. Nesbitt, J. Foote, and R.A. Clark. **Telehealth, Reduction of Waiting Time and Primary Care Support Are Key to Cardiac Rehabilitation Participation in People with Low Socio-Economic Status in Rural Australia.** Oral presentation - Beleigoli, A. 25-30 Jun. World NCD Congress 2023. Toronto, Canada, 2023.
2. Ramos, J., C. Drummond, O. Suebkinorn, L. Gebremichael, N. Bulamu, L. Dalleck, R.A. Clark, and A. Beleigoli. **What Speaks to the Heart of Women with Cardiovascular Diseases in Cardiac Rehabilitation?** Oral presentation - Ramos, J. 24-25 Jun. South Australian Rural Health Research and Education Conference (SARHRE). Barossa Novotel, 2023.
3. Gebremichael, L., A. Beleigoli, J. Foote, N. Bulamu, J. Ramos, R.A. Clark, and on behalf NHMRC CHAP Project Team. **Missed Opportunity: Evidence-Based Pharmacotherapy Prescription in Patients with Acute Coronary Syndrome Who Attended Secondary Prevention/Cardiac Rehabilitation Programs.** Oral presentation - Gebremichael, L. 24 -25 Jun. South Australian Rural Health Research and Education Conference (SARHRE). Barossa Novotel, 2023.
4. Bulamu, N., A. Beleigoli, K. Wanguhu, D. Heydon, B. Kaambwa, and R.A. Clark. **An Innovative Business Model Using Established Medicare Items for Delivery of Cardiac Rehabilitation – a Value Proposition for Primary Care.** Oral presentation - Bulamu, N. 23-24 Jun. South Australian Rural Health Research and Education Conference (SARHRE). Barossa Novotel, 2023.
5. Beleigoli, A., L. Gebremichael, N. Bulamu, K. Nesbitt, J. Ramos, and R.A. Clark. **Telehealth Is Associated with Higher Cardiac Rehabilitation Completion Rates among Patients with Cardiovascular Diseases Living in Rural and Remote Areas.** Oral presentation - Ramos, J. 24-25 June. South Australian Rural Health Research and Education Conference (SARHRE). Barossa Novotel, 2023.

6. Beleigoli, A., J. Foote, N. Bulamu, K. Nesbitt, L. Gebremichael, J. Ramos, and R.A. Clark. **Completion of Cardiac Rehabilitation Leads to Improved Clinical Outcomes in 10954 Patients within 365 Days Following an Acute Coronary Syndrome or Revascularization Procedure Admission.** Oral presentation - Clark, R.A. 23-24 Jun. ACNAP Congress 2023. Edinburgh, Scotland, 2023.
7. Nesbitt, K., L. Gebremichael, S. Champion, N. Bulamu, R.A. Clark, and A. Beleigoli. **Patient Reported Experiences with a Web-Based, Interactive, Clinically Integrated Cardiac Rehabilitation Program.** Poster presentation - Clark, R.A. 23-24 June. ACNAP Congress 2023. Edinburgh, Scotland, 2023.
8. Clark, R.A. Invited speaker - **Expert Panel.** 31 May. SA WHRTN EMCR Pitch Showcase. SAHMRI, Adelaide, 2023.
9. Ramos, J., C. Drummond, O. Suebkinorn, L. Gebremichael, N. Bulamu, L. Dalleck, R.A. Clark, and A. Beleigoli. **What Speaks to the Heart of Women with Cardiovascular Diseases in Cardiac Rehabilitation?** Poster presentation - Ramos, J. 8-10 May. 2023 Science on the Swan Conference. Perth, 2023.



Joyce Ramos' poster presentation at Science on the Swan, 2023

10. Ramos, J., A. Beleigoli, O. Suebkinorn, L. Gebremichael, N. Bulamu, L. Dalleck, and R.A. Clark. **A Preliminary-Analysis Investigating the Web-Based Cardiac Rehabilitation Needs and Preferences of Women in Rural Australia.** Poster presentation - Ramos, J. 30 May - 3 June. American College of Sports Medicine (ACSM). Denver, Colorado, 2023.
11. Ramos, J., and O. Suebkinorn. **Improving CR Quality: Engaging Women in Our Programs.** Presentation. 26 Apr. ICCPR ICRR Webinar. Virtual, 2023.

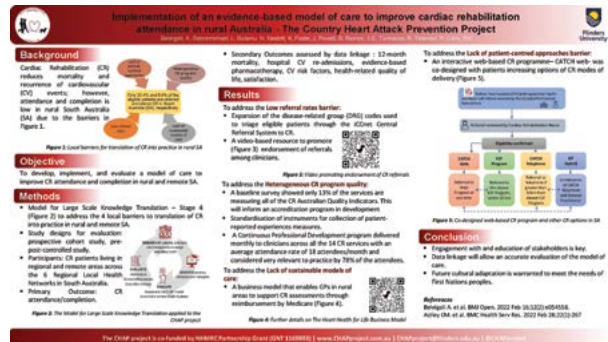


12. Ramos, J., A. Belegoli, O. Suebkinorn, L. Gebremichael, N. Bulamu, and R.A. Clark. **What Do Australian Women in Rural and Remote Areas Need from a Web-Based Cardiac Rehabilitation Program?: The Cardiac Rehabilitation Especially for Women (CREW) Project.** Poster presentation - Suebkinorn, O. 31 March - 1 April. ACNC Cardiac Nursing Symposium. Kirribilli Club, Sydney, 2023.
13. Nesbitt, K., L. Gebremichael, S. Champion, N. Bulamu, R.A. Clark, A. Belegoli, and on behalf of the NHMRC CHAP Partnership Project Team. **Cardiovascular Disease Patient Reported Experiences with a Web-Based, Interactive, Clinically Integrated Cardiac Rehabilitation Program.** Poster presentation - Clark, R.A. 31 March - 1 April. ACNC Cardiac Nursing Symposium. Kirribilli Club, Sydney, 2023.
14. Clark, R.A. **Consensus into Practice: Can We Change the Outlook for Hospitalised HFREF Patients?** Invited Speaker. 28 Feb. Post Novartis Cardiology Conference Meeting Stamford, Glenelg, 2023.
15. Clark, R.A. **Big Ideas in Heart Failure - Models of Care.** Invited Speaker. 11 - 12 Feb. Novartis Cardiology Congress. Hilton Hotel, Brisbane, 2023.



Prof Robyn Clark was a guest speaker at the Novartis Cardiology Conference in Brisbane in February 2023

16. Belegoli, A., L. Gebremichael, N. Bulamu, K. Nesbitt, J. Foote, S. Powell, J. Ramos, R. Tirimacco, P. Tideman, and R.A. Clark. **Implementation of an Evidence-Based Clinical Pathway to Improve Cardiac Rehabilitation Attendance in Rural Australia (the Country Heart Attack Prevention Project).** ePoster - Belegoli, A. 17-22 Nov. NHMRC Research Translation Symposium. Virtual, 2022.



Alline Belegoli's ePoster at NHMRC Research Translation Symposium, 2022

17. Nesbitt, K. **Usability of a Co-Designed, Web Based Cardiac Rehabilitation Program for Cardiac Patients Living in Rural and Remote Areas: Country Access to Cardiac Health (CATCH Web).** Oral presentation. 9-11 Nov. SFT-22 ATS Successes and Failures in Telehealth
18. Clark, R.A. **Does Cancer Treatment Break Your Heart? A Linked Health Data Analysis of the Characteristics and Survival of Patients Who Have Developed Cardiovascular Disease Post Cancer Treatment.** ePoster. 5-7 Nov. American Heart Association Scientific Sessions. Chicago, 2022.



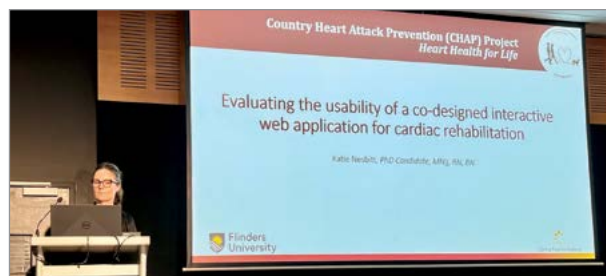
Prof Robyn Clark represented the CHAP Team in Chicago as part of the American Heart Association (AHA) Scientific Sessions in November 2022

19. Clark, R.A. **Improving Access to Cardiac Care for Australia's Most Disadvantaged Populations in 2022.** Oral presentation. 28 Oct. SA Cardiovascular Showcase. SAHMRI, 2022.



20. Beilegoli, A. **Evaluating Cardiac Rehabilitation Utilisation and Clinical Outcomes: A Data Linkage Analysis in the Country Heart Attack Prevention (CHAP) Project.** Oral presentation. 28 Oct. SA Cardiovascular Showcase. SAHMRI, 2022.
21. Haydon, D., K. Wanguhu. **Cardiac Rehabilitation Led by Rural GPs.** Oral presentation. 25 Oct. Rural Doctors Workforce Agency (RDWA). Virtual, 2022.
- 22.. Beilegoli, A. **Evaluating Cardiac Rehabilitation Utilisation and Clinical Outcomes: A Data Linkage Sub-Project within the Country Heart Attack Prevention (CHAP) Project.** Oral presentation. 19 Oct. HDCT Clinical Trial Intensive Workshop. FMC, 2022.
23. Beilegoli, A., L. Gebremichael, N. Bulamu, J. Ramos, K. Nesbitt, and R.A. Clark. **The Country Heart Attack Prevention (CHAP) Project: Developing, Implementing, and Testing a Model of Care to Improve Cardiac Rehabilitation for People with Cardiovascular Diseases in Rural and Remote South Australia – a Multi-Methods, Translation Project.** Oral Presentation - Beilegoli, A. 6 Sep. Rural and Remote Research Presentation Series 2022. Virtual, 2022.
24. Haydon, D. **Heart Health for Life - Cardiac Rehabilitation Led by Rural GPs.** Oral Presentation - Brentalls Health. 27 Aug. Rural Doctors Association South Australia (RDASA) Masterclass. Adelaide, 2022.

25. Beilegoli, A. **Country Heart Attack Prevention (CHAP) Heart Health for Life.** Oral Presentation - Beilegoli, A. 18 Aug. JCU Forum - Heart of Chronic Disease: Road to health. Virtual, 2022.
26. Clark, R.A. **Equity and Access to Care for Patients with Heart Failure, Heart Failure: Contemporary Approaches to Management for Patients with Heart Failure.** Invited Speaker. 11 - 14 Aug. CSANZ Annual Scientific Meeting 2022 Gold Coast, 2022.
27. Nesbitt, K., A. Beilegoli, S. Champion, L. Gebremichael, H. Du, J. Foote, R. Tirimacco, and Clark R.A. **Evaluating the Usability of a Co-Designed Interactive Web Application for Cardiac Rehabilitation.** Oral Presentation - Nesbitt, K. 11 - 14 Aug. CSANZ Annual Scientific Meeting 2022 Gold Coast, 2022.



Katie Nesbitt presenting at the CSANZ Annual Scientific Meeting in Gold Coast, 2022

28. Lymn, A., Clark R.A., K. Lambraskis, and D. Chew. **Re-Engineering the Cardiology Ward Round to Improve Efficiency in Care. Is There a Nurse in the Room?** Poster Presentation - Lymn, A. 11 - 14 Aug ed. CSANZ Annual Scientific Meeting. Gold Coast, 2022.
29. Nesbitt, K., A. Beilegoli, S. Champion, L. Gebremichael, H. Du, J. Foote, R. Tirimacco, and Clark R.A. **Development and Implementation of a Co - Designed, Web Based Cardiac Rehabilitation Program for Cardiac Patients Living in Rural and Remote Areas.** Poster Presentation - Nesbitt, K. 8 - 10 Aug. ACRA 2022. Gold Coast, 2022.
30. Astley, C., Beilegoli A., R. Travella, J. Hendriks, C. Gallagher, R. Tirimacco, G. Wilson, T. Barry, and Clark R.A. **Assessing the Quality of Cardiac Rehabilitation Programs by Measuring Adherence to the Australian Quality Indicators.** Poster Presentation - Astley, C. 8 - 10 Aug. ACRA 2022. Gold Coast, 2022.

## 'Heart Health for Life'

### Cardiac Rehabilitation Led by Rural GPs

Country Heart Attack Prevention (CHAP) Project, co-funded by NHMRC Partnership Grant (GNT 1169893)

#### CARDIAC REHAB IN REGIONAL SA

Figure 1: Modes of delivery for cardiac rehabilitation

#### WHAT IS THE PROBLEM?

- Cardiac Rehabilitation (CR) should be life long and requires long-term support,
- Clinical assessments are key to the success of CR across all modes of delivery, however for the rural and remote populations there are additional challenges:
  - providing face to face services through to completion, or telehealth-based services pre-CR and at 0, 6 months and 12 months post-completion,
  - access to specialist care and patient adherence.

#### THE SOLUTION

'Heart Health for Life'

- Sustainable CR in rural and remote GP practices with the GP at the centre of patient care,
- A model of CR care that will help to reduce secondary cardiac events for patients in Country SA,
- An IT/Telehealth Framework to coordinate CR delivery for data collection and sharing between GP practice and Integrated Cardiovascular Clinical Network (ICNet), data entry by patient and practice nurse, and Allied Health services to Country SA patients,
- Language shift from Chronic Disease to 'Heart Health for Life'.

Figure 2: GP as Principal Provider

#### THE BUSINESS CASE

What services can GPs provide?

- Utilise the Chronic Disease Care Planning MBS items to adapt the process to incorporate CR within GP context,
- Achieve all four objectives of the Quadruple Aim:
  - Improved patient experience of care
    - Care tailored to the needs of an individual
    - Coordinated and comprehensive care
    - Safe and effective care
    - Timely and equitable access
    - Increased skills and confidence to manage one's own care
  - Improved health outcomes & population management
    - Reduced disease burden
    - Increased focus on prevention
    - Improved quality of care
    - Improved in individual behavioural and physical health
  - Improved cost efficiency and sustainability in healthcare
    - More efficient and effective service delivery
    - Increased resourcing to primary care
    - Improved access to primary care, reducing demand on hospitals
  - Improved health care provider experience
    - Increased clinical and staff satisfaction
    - Increased flexibility and scope for innovation
    - Culture of feedback and learn-based approach
    - Quality improvement culture in practice

Figure 3: Quadruple Aim

#### GP ASSESSMENT SERVICES

Assessment	1-2 weeks	8-12 weeks	6 months	12 months
1. GP assessment	1. GP assessment	1. GP assessment	1. GP assessment	1. GP assessment
2. CR assessment	2. CR assessment	2. CR assessment	2. CR assessment	2. CR assessment
3. GP assessment	3. GP assessment	3. GP assessment	3. GP assessment	3. GP assessment
4. GP assessment	4. GP assessment	4. GP assessment	4. GP assessment	4. GP assessment

Figure 4: GP CR Assessment Services

GPs are involved in phase 2 of the program (at 6-10 weeks) and are required to complete 4 clinical assessments at 1-2 weeks, 8-12 weeks, 6 months and 12 months post discharge.

#### FINANCIAL MODELLING

Assessment	1-2 weeks	8-12 weeks	6 months	12 months
1. GP assessment	1. GP assessment	1. GP assessment	1. GP assessment	1. GP assessment
2. CR assessment	2. CR assessment	2. CR assessment	2. CR assessment	2. CR assessment
3. GP assessment	3. GP assessment	3. GP assessment	3. GP assessment	3. GP assessment
4. GP assessment	4. GP assessment	4. GP assessment	4. GP assessment	4. GP assessment

Figure 5: Financial Modelling

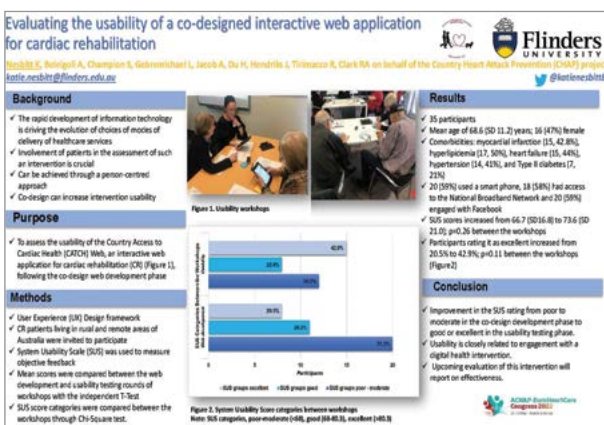
The full Business Case Report prepared by Brentalls Health can be downloaded using the QR code, via the CHAP website or email us at the address below to receive a pdf copy.

www.CHAPproject.com.au | CHAPproject@flinders.edu.au | @CHAPproject



Prof Robyn Clark and Dr Carolyn Astley poster presentation at ACRA 2022 on the Gold Coast (As Prof Clark's luggage was lost by Qantas, she needed to purchase a SeaWorld t-shirt to be Poster Moderator for this event)

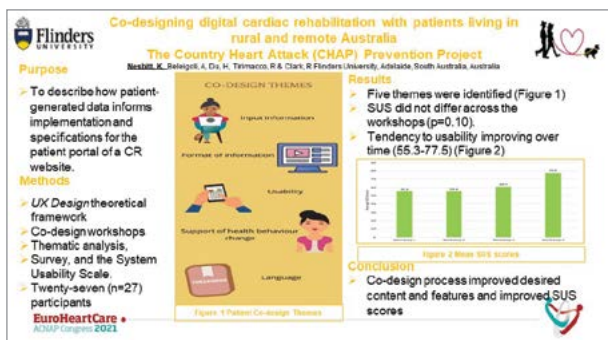
31. Beilegoli, A. **Cardiac Rehabilitation Especially for Women (CREW): A Person-Centered, Co-Designed Model of Care Embedded within an Existing Web-Based Cardiac Rehabilitation Program to Improve Attendance and Clinical Outcomes for Australian Women with Cardiovascular.** Invited Presentation - Beilegoli, A. 21 Jul. TAAHC Women's Health Forum. Virtual, 2022.
32. Clark, R.A. **What Does Access to Cardiac Care Mean in 2022?** Invited Speaker. 3 - 4 Jun. 4 Corners of Cardiology. Sydney, 2022.
33. Beilegoli, A. **A Model of Care to Improve Attendance to Cardiac Rehabilitation of Australians Living in Rural and Remote Areas.** Oral Presentation. 28 May. ACRA SA/NT Showcase. Adelaide, 2022.
34. Nesbitt, K., A. Beilegoli, S. Champion, L. Gebremichael, A. Jacob, H. Du, J. Hendriks, R. Tirimacco, R.A. Clark, and CHAP Project. **Evaluating the Usability of a Co-Designed Interactive Web Application for Cardiac Rehabilitation.** ePoster - Nesbitt, K. 22-23 May. ACNAP EuroHeartCare Congress / Heart Failure 2022. Virtual, 2022.



Katie Nesbitt's ePoster at ACNAP EuroHeartCare Congress, 2022

35. Astley, C., A. Beilegoli, R. Tavella, J. Hendriks, C. Gallagher, R. Tirimacco, G. Wilson, T. Barry, R.A. Clark, and CHAP Project. **Assessing the Quality of Cardiac Rehabilitation Programs by Measuring Adherence to the Australian Quality Indicators.** ePoster - Clark, R.A. 22 - 23 May. ACNAP EuroHeartCare Congress. Madrid, Spain, 2022.
36. Clark, R.A. **Second Prevention and Cardiac Rehabilitation.** Invited Speaker and Chair, 13 May. ACVA Joint National CV Implementation & Policy Roundtable Canberra, 2022.
37. Clark, R.A. **Success Stories and Some Illustrations of the Areas That Need Work.** Invited Speaker. 29 Apr. Australian Clinical Trials Alliance Limited (ACTA). Sydney, 2022.
38. Clark, R.A. **What Are the Unanswered Questions in Heart Failure Supportive Care in Cardio-Oncology?** Invited Speaker. 17-18 Mar. PaCCSC & CST Annual Research Forum 2022 | Clinical trials: new priorities. Sydney, 2022.
39. Beilegoli, A., S. Champion, R. Tirimacco, P. Tideman, and R.A. Clark. **The Country Heart Attack Prevention (CHAP) Project: A Telehealth-Based Model of Care to Improve Attendance to Cardiac Rehabilitation of Australians Living in Rural and Remote Areas.** Oral presentation - Beilegoli, A. 3 - 5 Nov. Successes and Failures in Telehealth Brisbane 2021.
40. Nesbitt, K., A. Beilegoli, H. Du, R. Tirimacco, S. Champion, and R. Clark. **Person Centred Co-Design Methodology for Web Portal Delivery of Services to Engage and Improve Attendance of Rural and Remote Patients in Cardiac Rehabilitation.** Oral Presentation - Nesbitt, K. 3 - 5 Nov. Successes and Failures in Telehealth Conference. Virtual, 2021.
41. Clark, R.A., and K. Nesbitt. **Overview of the CHAP Study and Website Co-Design Project.** Oral Presentation, 17 Sep. Heart Foundation Cardiac Rehabilitation State-wide Workshop. Adelaide, 2021.
42. Beilegoli, A. **Data Management, Data Linkage and Data Politics: A Case Study from the NHMRC CHAP Project.** Invited Presentation. 3 Sep. SAHMRI: Heart and Vascular Health's Seminar Program. Adelaide, 2021.
43. Beilegoli, A., S. Champion, K. Nesbitt, L. Gebremichael, and R.A. Clark. **CHAP Update.** Invited Presentation. 20 Aug. Flinders Medical Centre Cardiology Grand Round. FMC, 2021.

44. Beilegoli, A., S. Champion, R. Tirimacco, K. Govin, P. Tideman, and R.A. Clark. **COVID Reduced Attendance and Completion of CR Programs in Rural and Remote Australia.** ePoster - Beilegoli, A. 6 Aug. CSANZ 2021. Virtual, 2021.
45. Nesbitt, K., A. Beilegoli, H. Du, R.A. Clark, and R. Tirimacco. **Web-Based Cardiac Rehabilitation: A Codesign Experience with Patients Living in Rural and Remote South Australia in the Country Heart Attack (CHAP) Prevention Project.** Oral presentation - Nesbitt, K. 6 Aug. CSANZ 2021. Virtual, 2021.
46. Champion, S., A. Beilegoli, R. Tirimacco, P. Tideman, and R. Clark. **The Experiences of Telehealth and in-Person Cardiac Rehabilitation Services During COVID-19 and the Impact on Patient Engagement.** Oral Presentation - Champion, S. 3 - 5 Nov. Successes and Failures in Telehealth Conference. Virtual, 2021.
47. Nesbitt, K., A. Beilegoli, H. Du, R. Tirimacco, and R.A. Clark. **Co-Designing Digital Cardiac Rehabilitation with Patients Living in Rural and Remote Australia - the Country Heart Attack (CHAP) Prevention Project.** ePoster - Nesbitt, K. 18 - 19 Jun. EuroHeartCare ACNAP Congress, 2021.



Katie Nesbitt's ePoster at EuroHeart Care ACNAP Congress, 2021

48. Beilegoli, A., S. Champion, R. Tirimacco, K. Govin, P. Tideman, and R.A. Clark. **How the COVID Pandemic Affected Utilisation of Cardiac Rehabilitation in Rural Australia?** ePoster - Beilegoli, A. 18 - 19 Jun. EuroHeartCare ACNAP Congress. Virtual, 2021.
49. Clark, R.A. **Is Access a Risk Factor for CVD?** Invited Speaker. 10 - 13 Dec. CSANZ 2020 Nursing Oration. Virtual, 2020.
50. Clark, R.A. **Data-Driven Decision Making and Informatics for CVD Patient Care: Real World Examples from the Practice Research Nexus.** Invited Speaker. 6 Aug. CSANZ 2020 Virtual, 2020.

## 12 Accepted Presentations (beyond 30 June 2023)

Beyond June 2023 the team have another 12 abstracts that have been accepted to present the following presentations at the upcoming conferences during the second half of 2023.

51. Beilegoli A., J. Foote, J. Ramos, S. Powell, L. Gebremichael, K. Nesbitt, N. Bulamu, R.A. Clark, and on behalf NHMRC CHAP Project Team. **Cardiac Rehabilitation Reduces Risk of Overall Mortality within 12 Months after a Heart Failure Hospitalization: Data Linkage Analysis of 9,023 Patients in Australia.** Moderated Poster Presentation - Clark, R.A.. 25-28 Aug. ESC Congress 2023. Amsterdam, Netherlands, 2023.
52. Gebremichael, L., A. Beilegoli, J. Foote, N. Bulamu, J. Ramos, R.A. Clark, and on behalf of NHMRC CHAP Project Team. **Low Evidence-Based Pharmacotherapy Prescription for Patients Discharged after an Acute Coronary Syndrome: A Major Opportunity for Cardiac Rehabilitation Programs.** Prize Presentation - Gebremichael, L. 4-6 Aug. CSANZ 2023. Adelaide, 2023.
53. Pinero de Plaza, M.A., K. Lambraskis, E. Morton, A. Beilegoli, M. Lawless, P. McMillan, M. Archibald, R. Ambagtsheer, E. Khan, A. Mudd, R.A. Clark, C. Barrera-Causil, F. Marmolejo-Ramos, R. Visvanathan, and A. Kitson. **Proliferate AI: A Prediction Modeling Method to Evaluate Artificial Intelligence in Meeting End-User-Centric Goals around Better Cardiac Care.** 4-6 Aug. CSANZ 2023. Adelaide, 2023.
54. Ramos, J., C. Drummond, O. Suebkinorn, L. Gebremichael, N. Bulamu, L. Dalleck R.A. Clark and A. Beilegoli. **Identification of Needs and Preferences of Women in Rural Australia to Co-Design an Existing Web-Based Cardiac Rehabilitation Service: The Cardiac Rehabilitation Especially for Women (CREW) Project.** 4-6 Aug. CSANZ 2023. Adelaide, 2023
55. Beilegoli, A., J. Foote, J. Ramos, S. Powell, L. Gebremichael, K. Nesbitt, N. Bulamu, R.A. Clark, and on behalf NHMRC CHAP Project Team. **Quality of Cardiac Rehabilitation in Rural South Australia after a Quality Improvement Program: Results of the Country Heart Attack Prevention (CHAP) Project .** 4-6 Aug. CSANZ 2023. Adelaide, 2023.
56. Beilegoli, A., J. Foote, J. Ramos, S. Powell, L. Gebremichael, K. Nesbitt, N. Bulamu, R.A. Clark, and on behalf of NHRMC CHAP Project Team. **Quality of Cardiac Rehabilitation in Rural South Australia after a Quality Improvement Intervention: Results of the Country Heart Attack Prevention (CHAP) Project.** Oral presentation - Alline. 31 Jul - 2 Aug. ACRA 2023. Perth, 2023.



57. Bulamu, N., A. Belegoli, K. Wanguhu, D. Haydon, L. Gebremichael, S. Powell, P. Tideman, B. Kaambwa, R.A. Clark, and On behalf of NHMRC CHAP Project Team. **An Innovative Business model using established Medicare items for delivery of cardiac rehabilitation – a value proposition for primary care.** 4-6 Aug. CSANZ 2023.
58. Belegoli, A., J. Foote, L. Gebremichael, N. Bulamu, C. Astley, W. Keech, R. Tavella, A. Gulyani, K. Nesbitt, M.A. Pinero de Plaza, J. Ramos, M. Ludlow, J. Bennetts, P. Tideman, S.J. Nicholls, D.P. Chew, J. Beltrame, R.A. Clark, and on behalf of the NMHRC CHAP Project Team. **Improving Cardiac Rehabilitation Utilization Is Essential to Reducing Mortality and Cardiovascular Readmission: A Data Linkage Analysis of Cardiac Rehabilitation Utilization and Clinical Outcomes of 84,064 Eligible Separations in South Australia.** Oral presentation - Belegoli, A. 31 Jul - 2 Aug. ACRA 2023. Perth, 2023.
59. Nesbitt, K., S. Champion, L. Gebremichael, N. Bulamu, R.A. Clark, A. Belegoli, and on behalf of NHMRC CHAP Project Team. **Patient Program Fidelity and Reported Experiences with a Web-Based, Interactive, Clinically Integrated Cardiac Rehabilitation and Secondary Prevention Program (CATCH Web).** Oral presentation - Nesbitt, K. 31 Jul - 2 Aug. ACRA 2023. Perth, 2023.
60. Bulamu, N., A. Belegoli, K. Wanguhu, D. Haydon, L. Gebremichael, S. Powell, P. Tideman, B. Kaambwa, R.A. Clark, and on behalf of NHMRC CHAP Project Team. **An Innovative Business Model Using Established Medicare Items for Delivery of Cardiac Rehabilitation – a Value Proposition for Primary Care.** Clinical Excellence Showcase presentation - Bulamu, N. 31 Jul - 2 Aug. ACRA 2023. Perth, 2023.
61. Gebremichael, L., A. Belegoli, J. Foote, N. Bulamu, J. Ramos, R.A. Clark, and on behalf of the NHMRC CHAP Project Team. **Low Evidence-Based Pharmacotherapy Prescription for Patients Discharged after an Acute Coronary Syndrome: Presents an Important Opportunity for Prescribers before Cardiac Rehabilitation and Secondary Prevention Programs.** Prize presentation - Gebremichael, L. 31 Jul - 1 Aug. ACRA 2023. Perth, 2023.
62. Ramos, J., C. Drummond, O. Suebkinorn, L. Gebremichael, N. Bulamu, L. Dalleck, R.A. Clark and A. Belegoli. **Identification of Needs and Preferences of Women in Rural Australia to Co-Design an Existing Web-Based Cardiac Rehabilitation Service: The Cardiac Rehabilitation Especially for Women (CREW) Project.** Oral presentation - Ramos, J. 31 Jul - 2 Aug 23. ACRA 2023. Perth, 2023.

## 29 CPD SESSIONS

From June 2020 to December 2022, 29 monthly CPD sessions were held for CR clinicians with an average of 21+7 people attending each session throughout 2022.

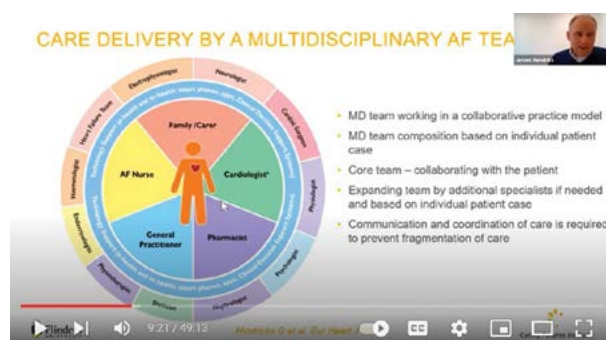
The CPD schedule with presenters and links to the recordings are available on the CHAP website at [www.chaproject.com.au/events](http://www.chaproject.com.au/events)



Guest speaker Prof Adam Scott in September 2022 on Module 8: Psychosocial wellbeing



Guest speaker Dr Rosemary Higgins in February 2022 on Module 1: Initial assessment and goal setting



Guest speaker Prof Jeroen Hendriks in July 2021 on National Cardiac Rehabilitation Quality Indicators



## 12 CO-DESIGN 'ROADSHOW' WORKSHOPS

74 participants (39 consumers) attended 12 co-design workshops held throughout SA from November 2020 to September 2021.



Workshop in Mt Gambier in November 2020



Workshop in Barossa in February 2021



Workshop in Mt Gambier in September 2021

## 6 SUCCESSFUL GRANTS

The following grants have been successful during the CHAP project, with CREW and CR4ALL becoming sub-projects and safe@home to commence 1 July 2023.

1. Clark, R.A., A. Beleigoli, R. Tirimacco, A. Rose, S. Cartledge, K. Govin, and P. Tideman. **COVID-19 Collaborative**. \$49,972.47: Caring Futures Institute, Flinders University, 2020.
2. Beleigoli, A., C. Hutchinson, M.A. Pinero de Plaza, R.A. Clark, R. Tirimacco, J. Hendriks, V.L. Versace, P. Tideman, I. Lynch, and W. Keech. **CR4ALL-Cardiac Rehabilitation for All: A Telehealth Cardiac Rehabilitation Care Pathway Tailored to the Needs and Preferences of Disadvantaged Populations Living with Cardiovascular Diseases in Rural and Remote Australia**. \$25,000: Flinders Foundation Health Seed Grants, 2021.
3. Clark, R.A., and A. Beleigoli. **Research Infrastructure Funding**. \$4,742: Flinders University, 2021.
4. Clark, R.A., J. Beltrame, R. Tirimacco, A. Beleigoli, P. Tideman, M. Arstall, S. Sierp, M. Ludlow, W. Keech, J. Hendriks, J. Ramos, S. Champion, L. Gebremichael, M.A. Pinero de Plaza, and K. Nesbitt. **Cardiac Rehabilitation Especially for Women (CREW): A Person-Centered, Co-Designed Model of Care Embedded within an Existing Web-Based Cardiac Rehabilitation Program to Improve Attendance and Clinical Outcomes for Women Living in Rural and Remote Areas with Cardiovascular Disease**. \$149,998: Hospital Research Foundation 2021.
5. Clark, R.A. **Research Infrastructure Funding**. \$9,414: Flinders University, 2023.
6. Clark, R.A., B. Kaambwa, J. Cleland, S.C. Inglis, R. Tirimacco, J. Maddison, S. George, P. Tideman, A. Beleigoli, and N. Bulamu. **safe@home: Effectiveness and Cost Effectiveness of Telemonitoring and Virtual Care Supported by Primary Care for People Living with Chronic Disease in Low Socioeconomic Neighbourhoods for Reducing Ambulance Ramping, Readmission and GP Clinic Block**. NHMRC \$1,096,999, and including partners \$2,193,999 2023.

## CHAP SUB-PROJECTS

Two sub-projects CR Especially for Women (CREW) and CR for All (CR4ALL) officially commenced in June 2022, being led by Dr Alline Beleigoli. These projects follow CHAP's framework in engaging, co-designing and evaluating CR care pathways but are tailored to the needs and preferences of people (with a focus on women and disadvantaged living with cardiovascular disease) in rural and remote SA.



CHAP, CR4ALL and CREW logos

## CREW

Cardiac Rehabilitation Especially for Women (CREW): a person-centred, co-designed care pathway embedded within an existing web-based cardiac rehabilitation program to meet the needs and preferences of Australian women living in rural and remote areas with cardiovascular disease. Funded \$150,000 by The Hospital Research Foundation to improve CR for women in rural and remote SA from June 2022 to 31 May 2024.

**Aim:** to increase attendance and completion of CR by women living in rural and remote areas.

**Chief Investigators:** R.A Clark, J. Beltrame, R. Tirimacco, A. Beleigoli, P. Tideman, M. Arstall, S. Sierp, M. Ludlow, W. Keech, J. Hendriks, J. Ramos, S. Champion, L. Gebremichael, M.A. Pinero de Plaza, and K. Nesbitt

## CR4ALL

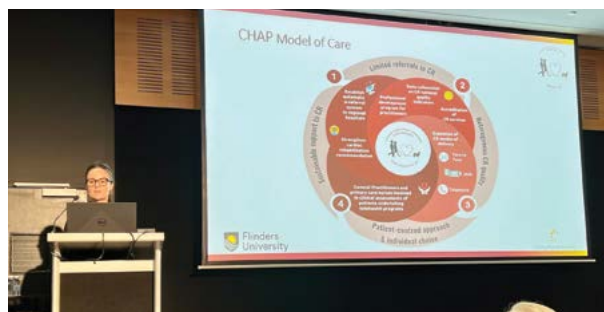
CR for All (CR4ALL): a telehealth cardiac rehabilitation care pathway tailored to the needs and preferences of disadvantaged populations living with cardiovascular disease in rural and remote Australia. Funded \$25,000 by Flinders Foundation to improve CR for disadvantaged populations in rural and remote SA from June 2023 to 31 January 2024.

**Aim:** to develop and implement CR4ALL, a new care pathway within iCCnet SA telehealth service to increase attendance and completion of CR among patients with a low socioeconomic status living in regional, rural and remote areas of Australia. In this proposal, the aim is to initiate the co-design of CR4ALL with patients with a low SES and professionals working in CR telehealth in SA.

**Chief Investigators:** A. Beleigoli, C. Hutchinson, M.A. Pinero de Plaza, R.A. Clark, R. Tirimacco, J. Hendriks, V.L. Versace, P. Tideman, I. Lynch, and W. Keech.

## 2 PHD STUDENTS RECRUITED

Katie Nesbitt – PhD candidate and clinical registered nurse working to improve secondary cardiovascular events in all populations, with a specific focus on those in rural and remote regions. Katie's PhD study is on the development, implementation and evaluation of an evidenced based, co designed, web based CR program for cardiac patients in rural and remote SA.



Katie Nesbitt presentation as part of the Cardiovascular Nursing Prize Finalist session at CSANZ Annual Scientific Meeting in the Gold Coast in August 2022

Orathai Suebkinorn – a PhD student from Thailand joined our team in March 2022. Ora has an interest in CR for adult patients suffering from cardiovascular diseases and commenced her PhD study on CREW Project.



Orathai Suebkinorn's confirmation of candidature presentation in March 2023

## SOCIAL MEDIA IMPACT



**Over 650 Followers**  
@CHAPproject



**Over 6000 Website views**  
chaproject.com.au

## 7 TEAM AWARDS

### SOLVE-CHD Video Competition Finalist

We submitted two entries in the 2023 SOLVE-CHD Inaugural CR Video Competition with one being a finalist out of 12 entries from around the globe. This video was developed by the CFI to illustrate the important partnership we have with the Heart Foundation and our passionate team of mid and early career multi-disciplinary researchers in action.

To view the 2-minute video go to <https://solvechd.org.au/cardiac-rehabilitation-video-competition-2023-entries/>

To view the full version go to <https://www.youtube.com/watch?v=F-qGx8eS4iw>

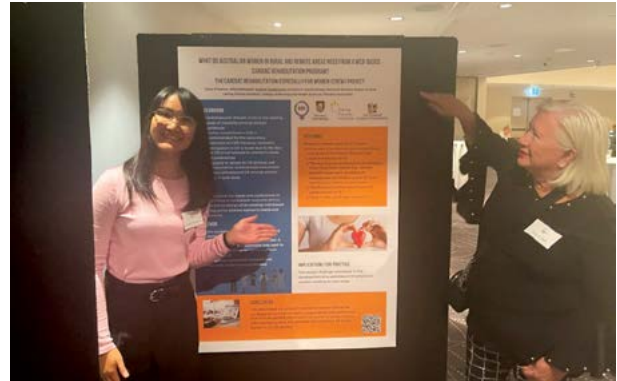


### Entry #3

By Prof Robyn Clark & Prof Jeroen Hendriks on Behalf of the Cardiac Research Group, Caring Futures Institute Flinders University South Australia

## Poster Prize

Orathai Suebkinorn won the poster prize at the Australasian Cardiovascular Nursing College (ACNC) Cardiac Nursing Symposium in Sydney in March 2023 on 'What do Australian women in rural and remote areas need from a web-based cardiac rehabilitation program?: the CREW project'.



Orathai Suebkinorn's winning poster prize at ACNC Cardiac Nursing Symposium in March 2023

## Translation Award Finalist

The CHAP Team was nominated for the 2022 Australian Cardiovascular Alliance (ACvA) Translation Award for improving low uptake of CR programs, by identifying barriers and providing scalable and implementable solutions.





## EJCN's Top Downloaded Paper in 2022

Katie Nesbitt and team's paper on UX Design as a co-design methodology is one of the top downloaded papers from European Journal of Cardiovascular Nursing (EJCN) in 2022. This will be awarded at the Association of Cardiovascular Nursing & Allied Professionals (ACNAP) Congress Welcome Reception and EJCN Award Ceremony on 23 June 2023 in Edinburgh Castle, Scotland.



ESC European Society of Cardiology  
European Journal of Cardiovascular Nursing (2022) 11, 178-183  
doi:10.1093/ejcn/zvab127

Methods Corner

### User Experience (UX) Design as a co-design methodology: lessons learned during the development of a web-based portal for cardiac rehabilitation

Katie Nesbitt<sup>1</sup>, Alline Beleigoli<sup>1</sup>, Huiyun Du<sup>1</sup>, Rosy Tirimacco<sup>2</sup>, and Robyn A. Clark<sup>1</sup>

<sup>1</sup>Caring Futures Institute, College of Nursing and Health Sciences, Flinders University, Adelaide, South Australia, Australia, and <sup>2</sup>Integrated Cardiovascular Clinical Network, South Australia (SA), Rural Support Services, SA Health, Australia

Received 5 December 2021; accepted 12 December 2021; online publication date 14 January 2022

<https://dx.doi.org/10.1093/ejcn/zvab127>

## Award Winners

Dr Alline Beleigoli won the Vice-President and Executive Dean (VPED) Research Award for Mid-Career Researcher in December 2021. She was nominated by the Deputy Vice-Chancellor Research (DVC-R) to be part of the Essence for Research Leadership Workshop in September 2022.



Dr Alline Beleigoli winning the VPED Research Award in December 2021

Dr Lemlem Gebremichael has become a CV Champ by participating in the Australian Cardiovascular Alliance (ACvA) Cardiovascular Champion Program in 2022/2023.



ACvA Australian Cardiovascular Alliance

### CV Champions Class of 2023



Three cheers for the CV Champions Class of 2022-23!! It was a huge intake this year. Congratulations to our 39 participants from 23 institutes across Australia.

Privacy - Terms

*“Undertaking cardiac rehabilitation online put me on the right path to take in regard to eating, drinking, exercising etc. The online videos I watched provided lots of information. This is an important requirement in changing lives to prevent future heart attacks.”*

- WENDY SIEFERT, CONSUMER



## TEAM RECOGNITION

### Prof Robyn Clark in Video



Our fearless leader Prof Robyn Clark explaining her vision for nursing after her appointment as Professor of Nursing and Director of Nursing and Midwifery Research at the Southern Adelaide Local Health Network (SALHN) in November 2022.

To view go to <https://www.youtube.com/watch?v=k5k6hQw8PUM>



As part of International Women's Day on 8 March 2022, Prof Robyn Clark provided a twitter message via the Heart Foundation supporting a team of outstanding women in heart and stroke research to balance their family and careers.

To view go to <https://twitter.com/heartfoundation/status/1500983501998686212>



Prof Robyn Clark talks about Telehealth in a number of online videos that you can access from our partner AstraZeneca Australia's website.

To view go to <https://www.azhealth.com.au>

### Katie Nesbitt in Video

Congratulations Katie Nesbitt for being asked not once, but twice by European Society of Cardiology Journal to record a video to discuss her published EJCN papers in March 2022 and May 2023.

To view the 'User Experience (UX) Design as a co-design methodology: lessons learned during the development of a web-based portal for cardiac rehabilitation' video on Twitter go to [https://twitter.com/ESC\\_Journals/status/1505122281281961988](https://twitter.com/ESC_Journals/status/1505122281281961988)



Do you want to learn more about the benefits of a structured methodology for co-designing? Listen to @katienesbitt8 on her #EJCN methods corner: [academic.oup.com/eurjcn/article...](https://academic.oup.com/eurjcn/article...)

@clark\_ra @escardio @ACNAPPresident @EditorEJCN #ACNAP @BorregaardBritt @MarielaAcunaM1



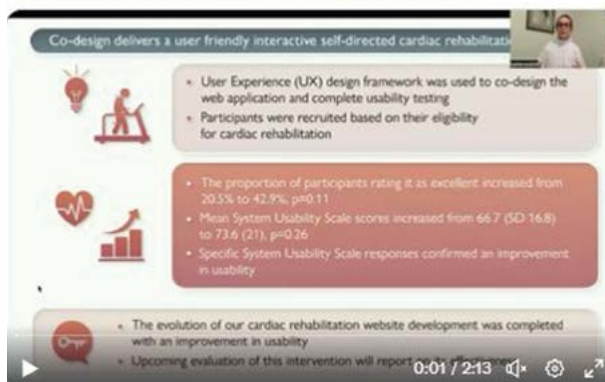
To view the paper go to <https://doi.org/10.1093/eurjcn/zvab127>

To view the 'Development and evaluation of a co-designed website for delivering interactive self-directed cardiac rehabilitation' video on Twitter go to [https://twitter.com/ESC\\_Journals/status/1654894740955963392](https://twitter.com/ESC_Journals/status/1654894740955963392)

To view the paper go to <https://doi.org/10.1093/eurjcn/zvad026>



Listen to Katie Nesbitt on how #codesign of a website for delivering interactive #cardiacrehab can improve #usability [doi.org/10.1093/eurjcn...](https://doi.org/10.1093/eurjcn...) Method corner on User Experience (UX) Design: [doi.org/10.1093/eurjcn...](https://doi.org/10.1093/eurjcn...) #EJCN @EditorEJCN @LeonieKlompstra



## Celebrating Heart Events

The team supported national heart events including Heart Foundation's National Heart Week Held in the first week of May each year and the World Heart Federation's World Heart Day celebrated every year on 29 September.



The team celebrating Heart Week in May 2022



Celebrating World Heart Day 29 September 2022

## External Articles

Ms Katie Nesbitt, Dr Alline Belegoli and Prof Robyn Clark's article on "patient centred cardiac rehabilitation: flexible, individualised and online" was published in the INSPIRE magazine - issue 24 on 16 August 2022 pages 42 and 43.

To view go to [https://issuu.com/researchaustralia/docs/ra0056\\_inspire\\_aug22](https://issuu.com/researchaustralia/docs/ra0056_inspire_aug22)

## State-wide standardisation and implementation of patient satisfaction surveys across all Cardiac Rehabilitation services

From Dr Lemlem Gebremichael (BPharm, Msc, PhD), Clinical Pharmacy Research Fellow, CHAP project.

Low service satisfaction with the cardiac rehabilitation programs may explain the low attendance and completion rate. Thus, understanding patient satisfaction is key to improve services and reduce the gap in translation of cardiac rehabilitation into practice.

As per guidelines, cardiac rehabilitation programs are structured across services with similar core components. However, instruments used to assess patient satisfaction vary across services in South Australia which hamper quality assessment and quality improvement initiatives. Therefore, the Country Heart Attack Prevention (CHAP) project has collected all forms used by the services in South Australia and developed a State-wide standardised patient satisfaction survey using Qualtrics to be used by all the services.

This form has been standardised with iterative engagement with consumer representatives, clinicians, and members of the South Australian Cardiovascular Coalition. The designed form with sections of relevant topics has been distributed and implemented by South Australia and Northern Territory services since August 2022.

Dr Lemlem Gebremichael's article on PREMS was published in the November 2022 edition of the Patient Reported Measures (PRMs) Research Collaborative e-news.

To view go to <https://mailchi.mp/84fcee3ca264/prms-research-collaborative-e-news-november-edition?e=7da12c6b72>

*"It has taken a long time to get cardiac rehabilitation at prime time in the cardiology world, this project is leading internationally making incremental changes on the current system to improve it".*

- DR PHIL TIDEMAN

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