

Embedding a statewide common measurement tool.

Samara Phillips¹, Statewide Cardiac Clinical Informatics Unit²

¹Queensland Health, Brisbane, Australia. ²Queensland Government Department of Health, Brisbane, Australia

Background: In 2016, the Queensland State Government announced an election commitment to improve the Heart Health of Queenslanders, specifically the referral to, and uptake of cardiac rehabilitation (CR). However, in 2016, Queensland had no common measurement tool to capture these parameters.

Method: A statewide clinician led working group was developed to review and agree on commonly collected, relevant parameters used for referral and assessment forms. The employment of a statewide project lead facilitated the development and build of a CR specific module within Queensland Cardiac Outcomes Registry (QCOR). This web delivered

application was then piloted in 10 metro and regional sites.

Incorporating pilot feedback, statewide roll out occurred from 1 July 2017. Assisted by the project lead, user guide resources and videoconferencing support was offered. Simultaneously, a Quality Improvement Payment (QIP) provided financial incentive to implement and utilise QCOR at a Health Service level.

Outcomes: At introduction, 89% of CR sites utilised the QCOR CR module. Despite the removal of QIP, QCOR use has been sustained (table 1).

| | 2016 | 2017[half year + funding incentive] | 2018 [funding incentive removed halfway] | 2019 [no funding incentive] |
|--|-----------|-------------------------------------|--|-----------------------------|
| Number of outpatient CR programs including Health Services Queensland | 34 | 34 | 35 | 37 |
| Number of sites delivering outpatient CR | 54 | 54 | 60 | 62 |
| Number of outpatient CR programs using QCOR | 0/34[0%] | 29/34 [85%] | 31/35 [89%] | 32/37 [86%] |
| Number of sites using QCOR | 0/54 [0%] | 48/54 [89%] | 55/60 [92%] 52/60* [87%] | 56/62 [90%] 54/62* [87%] |

*additional sites used QCOR<50% due to local staffing issues

Implications & lessons learned: The development of QCOR for CR was a clinician-led initiative, and despite the removal of incentive funding, has continued. Ongoing use can be attributed to the system reflecting workflow practices and Health Information Management System documentation thus ensuring clinicians are not duplicating effort and are benefiting from using the system.

A practice support tool has enabled clinicians to deliver CR as well as contribute to a statewide reporting system to monitor CR performance, is embedded within Queensland.

Telephone health coaching (The COACH Program[®]) provides effective and equitable access to an evidence-based cardiovascular disease (CVD) prevention program for patients with, or at risk of, coronary heart disease in Tasmania who are unable to attend face to face cardiac rehabilitation.

Ms Minke Hoekstra¹, Ms Sue Sanderson², Ms Caroline Wells¹, A/Prof Margarite Vale³

¹Diabetes Tasmania, Hobart, Australia. ²Tasmanian Health Organisation South, Hobart, Australia. ³The COACH Program, Melbourne, Australia

Background: Cardiac rehabilitation is an effective and essential care pathway to assist in the recovery of, and reduction of hospital re-admissions for patients with coronary heart disease (CHD). However not all eligible patients are referred to, or able to attend a cardiac rehabilitation service due to geographical isolation, return to work or extended waiting lists.

Method: Since January 2019, telephone health coaching (The COACH Program) delivered by Diabetes Tasmania has been offered as an additional cardiac rehabilitation option for patients at risk of CHD; post- heart attack or post-stent discharged from the Tasmanian Health Service (THS) who are unable to attend the THS Cardiac Rehabilitation Program.

Outcomes:

Table 1: Percentage graduated patients who achieved risk factor target levels at entry and graduation from The COACH Program (paired observations).

n=40: 32 with CHD, 8 at high risk of CHD; males (68%), females (32%); mean age 62 years.

| Risk factor | At entry | At completion | Percent change improvement |
|---------------------------|----------|---------------|----------------------------|
| LDL-cholesterol | 11% | 63% | 52% |
| Triglycerides | 62% | 90% | 28% |
| Blood pressure | 62% | 81% | 19% |
| HbA1c (diabetes patients) | 22% | 44% | 22% |
| Not smoking | 90% | 93% | 3% |
| Alcohol intake | 79% | 87% | 8% |
| Physical activity | 79% | 91% | 12% |

Conclusion / implications for practice: Tasmanians are at high risk of heart disease and geographically diverse. The COACH Program has been clinically proven to improve CVD risk factors; help patients live longer and achieve substantial net cost

savings. Delivered by telephone by trained health professionals, it provides an additional CVD prevention pathway and complements traditional face to face cardiac rehabilitation programs.

Aquatic exercise for stable coronary heart disease

Ms. Anna Scheer¹, Dr. Beatriz IR de Oliveira¹, Dr. Amit Shah², Winthrop Professor Daniel Green³, Associate Professor Andrew Maiorana^{1,2}

¹Curtin University, Perth, Australia. ²Fiona Stanley Hospital, Perth, Australia. ³University of Western Australia, Perth, Australia

Clinical or Research Abstract

Background: Exercise is important in coronary heart disease (CHD) management, yet adherence to physical activity guidelines are low. High rates of arthritis in CHD may contribute to this, warranting investigation of a low-impact exercise option, such as aquatic training (AT). Additionally, aquatic exercise increases cardiac output and may increase shear stress, a mediator of artery function.

Methods: Participants with CHD were randomised to 12 weeks of circuit-training exercise 3 sessions per week of AT, gym training (GT), or usual activities (CG). VO_{2peak} , muscle strength, DXA scans and artery function (flow mediated dilation; FMD) were assessed.

Results: Fifteen completed AT, 18 completed GT and 12 completed CG. No significant changes seen in the CG, or between training groups, except biceps, $p=0.029$.

| Outcome | Week 0 | Week 12 | p pre-post | p vs CG |
|---|------------------|------------------|------------|---------|
| VO_{2peak} (mL.kg ⁻¹ .min ⁻¹) AT | 27.6 (24.6-30.6) | 29.4 (26.3-32.5) | 0.006 | 0.009 |
| VO_{2peak} (mL.kg ⁻¹ .min ⁻¹) GT | 26.1 (23.2-28.9) | 27.7 (24.9-30.6) | 0.002 | 0.008 |
| Hamstrings(kg) AT | 50.4 (44.3-56.4) | 55.6 (49.2-61.9) | 0.003 | 0.015 |
| Hamstrings(kg) GT | 51.5 (45.6-57.4) | 58.0 (52.1-64.0) | <0.001 | 0.001 |
| Biceps(kg) AT | 10.4 (8.7-12.0) | 10.3 (8.6-12.0) | 0.792 | 0.501 |
| Biceps(kg) GT | 10.5 (8.9-12.1) | 11.5 (9.8-13.1) | 0.003 | 0.188 |
| Body fat(kg) AT | 28.9 (24.9-32.8) | 28.0 (24.0-31.9) | 0.015 | 0.057 |
| Body fat(kg) GT | 29.5 (25.5-33.5) | 28.5 (24.5-32.4) | 0.003 | 0.032 |
| FMD(% change from baseline) AT | 3.9 (2.8-5.0) | 5.0 (3.8-6.1) | 0.017 | 0.723 |
| FMD(% change from baseline) GT | 4.7 (3.6-5.8) | 5.3 (4.2-6.5) | 0.120 | 0.637 |

Clinical implications: Aquatic training improved fitness, leg strength, body fat and artery function in people with CHD, highlighting it as an effective, low-impact exercise option.

Shorter wait times promote greater exercise capacity improvements in cardiac rehabilitation: A multi-site study

Mr Dion Candelaria¹, Mr Robert Zecchin², Ms Cate Ferry³, Dr Laila Ladak^{4,1}, Dr Sue Randall¹, Professor Robyn Gallagher¹

¹The University of Sydney, Sydney, Australia. ²Western Sydney Local Health District, Westmead, Australia. ³The National Heart Foundation of Australia, Sydney, Australia. ⁴The Aga Khan University, Karachi, Pakistan

Background: Comprehensive exercise-based cardiac rehabilitation (CR) results in improved exercise capacity. However, whether these improvements are associated with CR program characteristics such as wait time has not been adequately investigated.

Methods: Patients with coronary heart disease (CHD) (\pm primary percutaneous coronary interventions [PCI], elective PCI, cardiac surgery) who attended CR programs involved in a state-wide audit (n=39) were eligible for this study. Change in exercise capacity was measured using the 6-minute walk test (6MWT) before and after a 6-8-week supervised exercise program. Program characteristics were also recorded (wait time, number of sessions). Correlations and general linear models were used to identify associations between sociodemographic and CR program characteristics and improvements in exercise capacity.

Results: A total of 894 patients were included. Mean age was 65.94 \pm 11.84 years, 71.1% males, 32.7% referred for cardiac surgery, and median wait time was 16 days (IQR 9, 26). Exercise capacity improved significantly and clinically (mean increase 70.4 \pm 61.75m, P<.001). Wait time was significantly correlated with changes in exercise capacity (r=-.108, P<.01). After adjusting for significant factors such as younger age (<50 compared to \geq 80 years [β =49.62]), male sex (β =15.83), smoking status (β =15.80), exercise capacity at CR entry (β =.225) and other non-significant factors (ethnicity,

cardiovascular risk factors, number of sessions), shorter wait time was associated with more improvements in exercise capacity (β =.226).

Conclusions: Wait time differences contribute to variations in exercise capacity outcomes from CR. Identification of strategies to minimise wait times is recommended to optimise exercise outcomes.

Australian cardiac rehabilitation exercise parameter characteristics and perceptions of high-intensity interval training: a cross-sectional survey

Assistant Professor Amanda Hannan¹, Professor Wayne Hing¹, Associate Professor Mike Climstein², Professor Jeff Coombes³, Assistant Professor James Furness¹, Professor Rohan Jayasinghe⁴, Dr Joshua Byrnes⁵

¹Bond University, Gold Coast, Australia. ²Southern Cross University, Gold Coast, Australia. ³University of Queensland, Brisbane, Australia. ⁴Gold Coast University Hospital, Gold Coast, Australia. ⁵Griffith University, Gold Coast, Australia

Purpose: This study explored demographics, characteristics, costs, evaluation methods, and outcome measures used in Australian cardiac rehabilitation (CR) programs. It also determined the actual usage and perceptions of high-intensity interval training (HIIT).

Methods: A cross-sectional observational web-based survey was distributed to 328 Australian CR programs nationally.

Results: A total of 261 programs completed the survey (79.6% response rate). Most Australian CR programs were located in a hospital setting (76%), offered exercise sessions once a week (52%) for 6–8 weeks (49%) at moderate intensity (54%) for 46–60 min (62%), and serviced 101–500 clients per annum (38%). Only 1% of programs used HIIT, and 27% of respondents believed that it was safe while 42% were unsure. Lack of staff (25%), monitoring resources (20%), and staff knowledge (18%) were the most commonly reported barriers to the implementation of HIIT. Overall, Australian CR coordinators are unsure of the cost of exercise sessions.

Conclusion: There is variability in CR delivery across Australia. Only half of programs reassess outcome measures post intervention, and cost of exercise sessions is unknown. Although HIIT is recommended in international CR guidelines,

it is essentially not being used in Australia and clinicians are unsure as to the safety of HIIT. Lack of resources and staff knowledge were perceived as the biggest barriers to HIIT implementation, and there are inconsistent perceptions of pre-screening and monitoring requirements. This study highlights the need to educate health professionals about the benefits and safety of HIIT to improve its usage and patient outcomes.

Who is attending cardiac rehabilitation in QLD?

Mrs Samara Phillips¹, Statewide Cardiac Clinical Informatics Unit²

¹Queensland Health, Brisbane, Australia. ²Queensland Government Department of Health, Brisbane, Australia

Background: With the implementation of the Queensland Cardiac Outcomes Registry (QCOR), analysis of who is referred to and assessed for cardiac rehabilitation (CR) within public outpatient programs can occur. This information is vital for determining which population groups are being captured, where gaps exist, and how services can target these patients. In 2018, QCOR was used by 89% of the outpatient CR programs within Queensland.

Methods: Data was extracted from QCOR to identify the demographic profile of patients receiving a pre-program assessment and those who decline attendance.

Outcomes: The characteristics of patients that attend and decline a pre-program assessment are described in Table 1. It is positive to observe that those patients suffering IHD and clearly benefit from CR, attend in 65% cases. Most clients who declined CR had an 'other' diagnosis. Recipients of invasive cardiac procedures are more likely to participate in an assessment, however still feature strongly in the decline category. Interestingly, irrespective of geographical location, attendance at pre-program assessment was similar to those rates that declined.

Table 1. Patient profile according to CR Program attendance status

| | Attend Pre-program Assessment (n=7,661) | Decline Pre-program Assessment (n=1,092) |
|---------------------------|--|---|
| Age and Gender | Male 65yo | Male 68yo |
| | Female 67yo | Female 71yo |
| Diagnosis | | |
| Ischaemic Heart Disease | 4,982 (65%) | 459 (42%) |
| Valvular Disease | 637 (8.3%) | 50 (4.6%) |
| Other | 2,042 (26.7%) | 583 (53.4%) |
| Recent Procedure | | |
| PCI | 2,998 (39.1%) | 213 (19.5%) |
| Coronary Angiogram | 1,375 (17.9%) | 215 (19.7%) |
| CABGS | 1,115 (14.6%) | 48 (4.4%) |
| Valve Procedure | 539 (7%) | 45 (4.1%) |
| Device Procedure | 174 (2%) | 18 (1.6%) |
| CABGS and Valve procedure | 153 (2%) | 10 (0.9%) |
| Other | 246 (3.2%) | 42 (3.8%) |
| Not Specified | 1,061 (13.8%) | 501 (45.9%) |
| Place of Residence | | |
| Major cities of Australia | 4,030 (52.6%) | 536 (49.1%) |
| Inner regional Australia | 2,283 (29.8%) | 332 (30.4%) |
| Outer regional Australia | 1,073 (14%) | 182 (16.7%) |
| Remote Australia | 92 (1.2%) | 14 (1.3%) |
| Very remote Australia | 176 (2.3%) | 24 (2.2%) |

Conclusion: A limitation of this analysis is that the information is reliant upon the quality of the referral and sometimes not all data elements are complete, especially the most recent procedure. Linkage with other QCOR registries has been undertaken to

assist with understanding this element. Knowledge of who is declining to attend CR assessment can assist with targeting those clients to enter the program and address any perceived barriers.

What are the baseline patient characteristics that determine improvement in depression following CR in patients with new onset depressive symptoms?

MSc Serdar Sever, Prof. Patrick Doherty, Dr. Su Golder, MSc Alexander Harrison

University of York, York, United Kingdom

Background: Cardiovascular disease patients commonly experience depressive symptoms which is associated with adverse outcome and increased mortality. Examining the baseline characteristics of cardiac rehabilitation (CR) patients that determine depression outcome may facilitate adjustments in CR programme delivery. This study aims to investigate whether comorbidities, demographic and clinical characteristics of patients, with new onset post cardiac event depressive symptoms, determine change in their depression following CR.

Methods: Analysing the routine practice data of British Heart Foundation National Audit of Cardiac Rehabilitation between April 2012 and March 2018, an observational study was conducted. Patients with new onset post cardiac event depressive symptoms and no previous documented history of depression constituted the study population. Independent sample t-tests and chi-square tests were used to examine the baseline characteristics followed by binary logistic regression analysis to predict the change in Hospital Anxiety and Depression Scale (HADS) depression outcome.

Results: The analyses included 64,658 CR patients (66.24±10.69 years, 75% male) with new onset HADS measures. The comorbidities determining reduced likelihood of improvement in depression outcomes following CR were: angina, diabetes, stroke, emphysema, and chronic back problems. In addition, higher total number of comorbidities, increased weight, a higher HADS anxiety score, smoking at baseline, physical inactivity, presence

of heart failure, and being single were other significant determinants. However, receiving CABG treatment was associated with better improvement.

Conclusion: These findings could help CR programmes focus on tailoring the CR intervention around comorbidity, physical activity status, weight management and smoking cessation in patients with new onset depressive symptoms.

Providing nutrition care at cardiac rehabilitation. A survey of current practice and attitudes in Australia.

Ms Lucy Kocanda^{1,2,3,4}, Dr Tracy Schumacher^{1,2}, Ms Jane Kerr⁵, Professor Jennifer May¹, Dr Megan Rollo^{6,2}, Associate Professor Leanne Brown^{1,2}

¹Department of Rural Health, University of Newcastle, Tamworth, Australia. ²Priority Research Centre for Physical Activity and Nutrition, University of Newcastle, Callaghan, Australia. ³Priority Research Centre for Health Behaviour, Callaghan, Australia. ⁴Hunter Medical Research Institute, New Lambton, Australia. ⁵Hunter New England Local Health District, Tamworth, Australia. ⁶School of Health Sciences, University of Newcastle, Callaghan, Australia

Background: Nutrition is a core component of cardiac rehabilitation (CR). Australian evidence suggests that most programs include nutrition education. However, there is no published literature that explores the education content or how it is provided. This study aims to determine current practice, facilitators and barriers to providing nutrition care at CR in Australia.

Methods: Program coordinators were invited to take part in an anonymous online survey during October/November 2019. Survey questions about current practice were developed by the authors. Those about facilitators and barriers were adapted from a validated tool based on the Theoretical Domains Framework.

Results: Forty-nine (13.4%) participants responded and were included in the analysis. Most programs (n=31, 63.3%) were consistently supported by a dietitian. Common education topics were increasing fruit and vegetable intake, decreasing saturated fat and sodium intake. Although less common, low fat (n=15) and sugar (n=16) diets were advised.

Respondents agreed that all patients should receive nutrition care in CR. Participants were positive about benefits to patients and the nutrition knowledge of program staff. They were less positive about their skills and capabilities to support patients in nutrition related behaviour

changes. Lack of program financial resources was an identified barrier to providing nutrition care.

Conclusions: To ensure patients receive the benefits of accurate, evidence-based nutrition information, as well as support to make nutrition related behaviour changes, CR programs may require additional support. Solutions must acknowledge the complexities of nutrition related behaviour change, and the resource constraints that may impact CR programs in Australia.

Does changing the frequency and duration of the Phase 2 Cardiac Rehabilitation Program influence attendance rates?

Mrs Jacquelyn Dunstan, Ms Debra McCluskey, Mrs Anne McIntosh, Mr Owen Howlett

Bendigo Health, Bendigo, Australia

Rationale: Between 2014 and 2019, 53% (n= 323) of attendees did not complete the Bendigo Health's Phase Two Cardiac Rehabilitation program. In response to attendee survey feedback (with the aim of increasing attendee participation), in 2019 the program was modified to require twice-weekly attendance for 6 weeks, instead of one session per week for 12 weeks.

Method: A retrospective review of attendance data from 2014 to the end of 2019 was completed. Descriptive statistics were generated prior to and after the implementation date. CHI square test of independence identified if changes in attendance were statistically significant.

Outcome: Between 2014 – 2018, 610 people attended the program: 53% (n=323) attended between 1 and 10 sessions, 36% (n=221) attended between 11-12 session and 11% (n=66) attended more than 12 sessions. After implementing the two session per week program, 115 people attended the program: 38% (n=44) attended between 1 and 10 sessions, 51% (n=58) attended between 11-12 session and 11% (n=13) attended more than 12 sessions. CHI square test of independence demonstrated a statistically significant change of $P=0.009$ (95% CI). Sub group analysis demonstrated significant change according to the male gender (95% CI; $p=0.007$), and people aged 18 to 59 (95% CI; $p=0.018$).

Conclusion: A greater rate of program completion has been demonstrated after the Phase 2 Cardiac Rehabilitation program was delivered over a shorter time span, with equal number of sessions to the pre-2019 program. Further understanding of how changes in program structure impacted the clinical outcomes of attendees, is recommended.

Innovative lung and sternum ultrasound education program for nurses and physiotherapists

Mrs Lynda Tivendale^{1,2}, Professor Alistair Royse^{1,2}, Associate Professor Doa El-Ansary^{3,2}, Professor Colin Royse^{2,1}, Associate Professor David Canty²

¹The Royal Melbourne Hospital, Melbourne, Australia. ²University of Melbourne, Melbourne, Australia.

³Swinburne University, Melbourne, Australia



An innovative education program for nurses and physiotherapists to obtain the skill of lung and sternal ultrasound as an assessment tool.

Point-of-care ultrasound imaging is an emerging and valuable clinical assessment tool.

Current education and training programs were reviewed. We learnt that didactic styles of workshops showed retention of knowledge and translation to clinical practice had not been ideal; online platforms had some retention but limited application to the clinical setting.

We developed a targeted blended learning system education program. Online learning, workshop, simulation cases and self-directed clinical practice. Our innovation of clinical mentored ward rounds was introduced to address the gap in the education program. Facilitators led the rounds weekly. Interactive learning and scanning was performed, discussions of the clinical implications related to the scan's findings and communication to the treating team.

Parallel to the education program we conducted a research program to investigate whether simulator training followed by clinical mentored ward rounds increased image acquisition skills and interpretive accuracy compared to online learning alone and the feasibility and satisfaction of learning methods by the participants.

Our cardiothoracic nurses and physiotherapists were invited to enroll in the program. 43 nurses and physiotherapists have enrolled.

We found that theoretical knowledge improved significantly with simulation and clinical mentored rounds. These modes were highly rated and resulted in a high uptake of ultrasound knowledge and translating to their everyday clinical practice.

Ultrasound imaging of the lung and sternum is performed in patient assessments. The engagement and communication within the multidiscipline team has led to timely clinical decision making and ultimately better outcomes for patients.

Thinking outside the square for post PCI care

Mr Greg Coad

Bendigo Health, Bendigo, Australia

- With the move to the new hospital in 2017, there was no dedicated cardiac beds in Bendigo Health, this placed increased pressure on ICU and potential delays in treatment.
- From 2017 to 2019 the number of patients referred for angiography more than doubled resulting in frequent cancellation of elective PCI/stents due to lack of suitable bed in ICU

Proposal

- Elective stable single vessel PCIs be admitted to Ward 5A complex care room (CCR).
- Create policies and guidelines regarding PCI management on a medical ward; no policy currently available in public health system.

Process

Preparation for PCIs to be cared for in CCR included:

- Appointment of Cardiology Clinical Nurse Specialist On ward
- Cardiac and catheter lab education of staff that work in CCR
- Staff supported to undertake post graduate studies in Cardiac nursing
- Care of PCI s included in 5A Mandatory competency day
- Staff encouraged to attend Cardiac fundamentals study day, ECG courses, Deteriorating patient study days & clinical simulation days
- Education sessions, competency packages on TR bands, telemetry, 12 lead ECG

Outcome

Decrease in elective PCI/stents cancellations:

- 1 January – 31 December 2017 – **35** elective patients cancelled.
- 1 January 2019 – 31 January 2020 – with the noted increase in elective admissions, only **15** elective patients cancelled.
- The increased skill level required to work in the CCR and care for post PCI's encouraged staff education and post graduate studies. This has resulted in an increase in staff retention and job satisfaction.

Frustration, Collaboration, Creation. A patient centred approach to the management of Chronic Heart Failure.

Ms Michelle Baird, Ms Debbie Beahan, Ms Jennifer Oliver

Western NSW LHD, Dubbo, Australia

Disparity in the management of Chronic Heart failure is seen as the patients' willingness not to engage in prescribed treatment. Patient X identified as Aboriginal and Torres Strait Islander was admitted to hospital 3 times within 3 months post MVR. Although home visits by 7 different clinicians took place, patient X did not use medications as prescribed resulting in patient and clinician frustration.

The Chronic Care Nurse and Aboriginal Health Practitioner attended a home visit to discuss *"What would she like her health to look like?, how did she see her healthcare?, and how we could work collaboratively to help her achieve her goals?"*

The team adopted a collaborative client centred approach exploring patient challenges to medication use: incontinence, access to toileting and impact on quality life. To assist the patient in managing her CHF through prescribed medication twice daily text messaging was implemented.

The primary outcome of increased medication use was achieved. A secondary outcome of improved patient self –efficacy was also achieved. The patient reported *"I didn't think I could do this!"*

The value of collaborative conversations with patients to identify the challenges they experience in self-managing CHF. This creates open dialogue to develop a patient centred care plan resulting in improved quality of life.

Initially the patient described feeling overwhelmed and loss of control in managing her CHF with multiple clinician's home visiting. A more coordinated clinical approach to home visits created a manageable environment for the patient to self-manage.