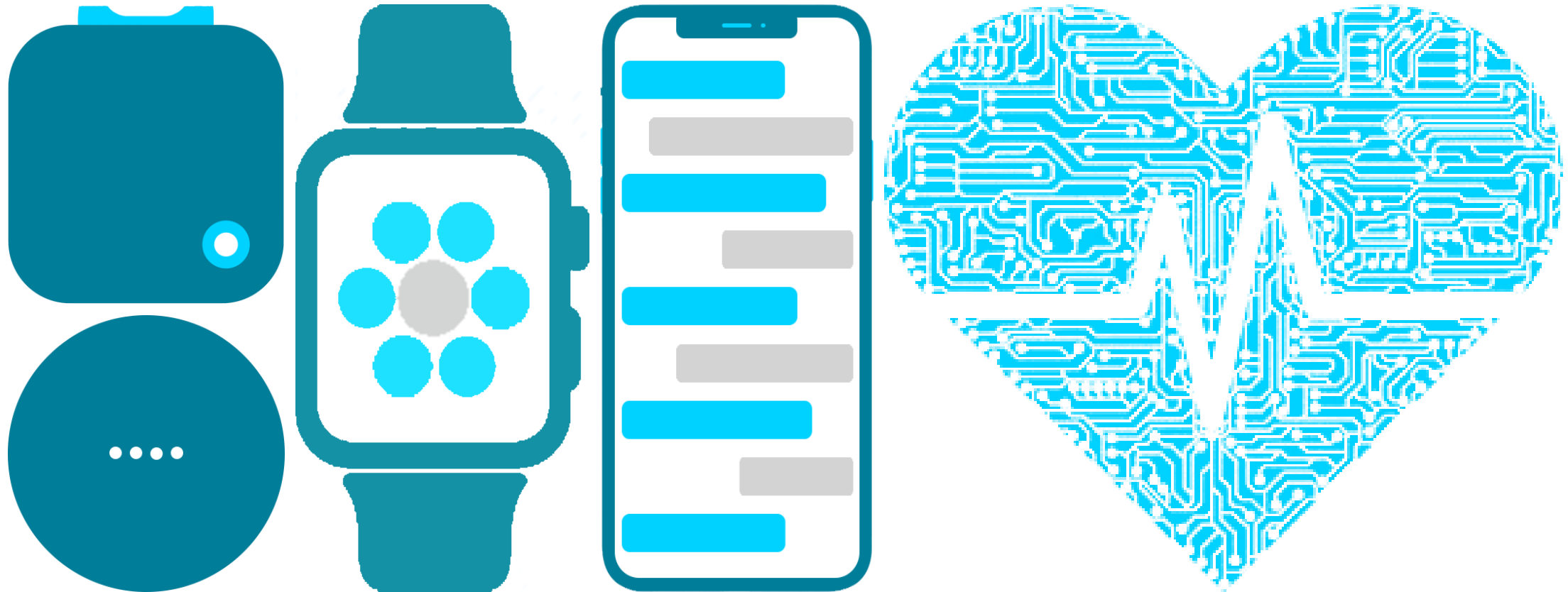


# A C21<sup>st</sup> (pandemic friendly) approach to delivering cardiac rehabilitation

Centre for Online Health Telehealth Forum

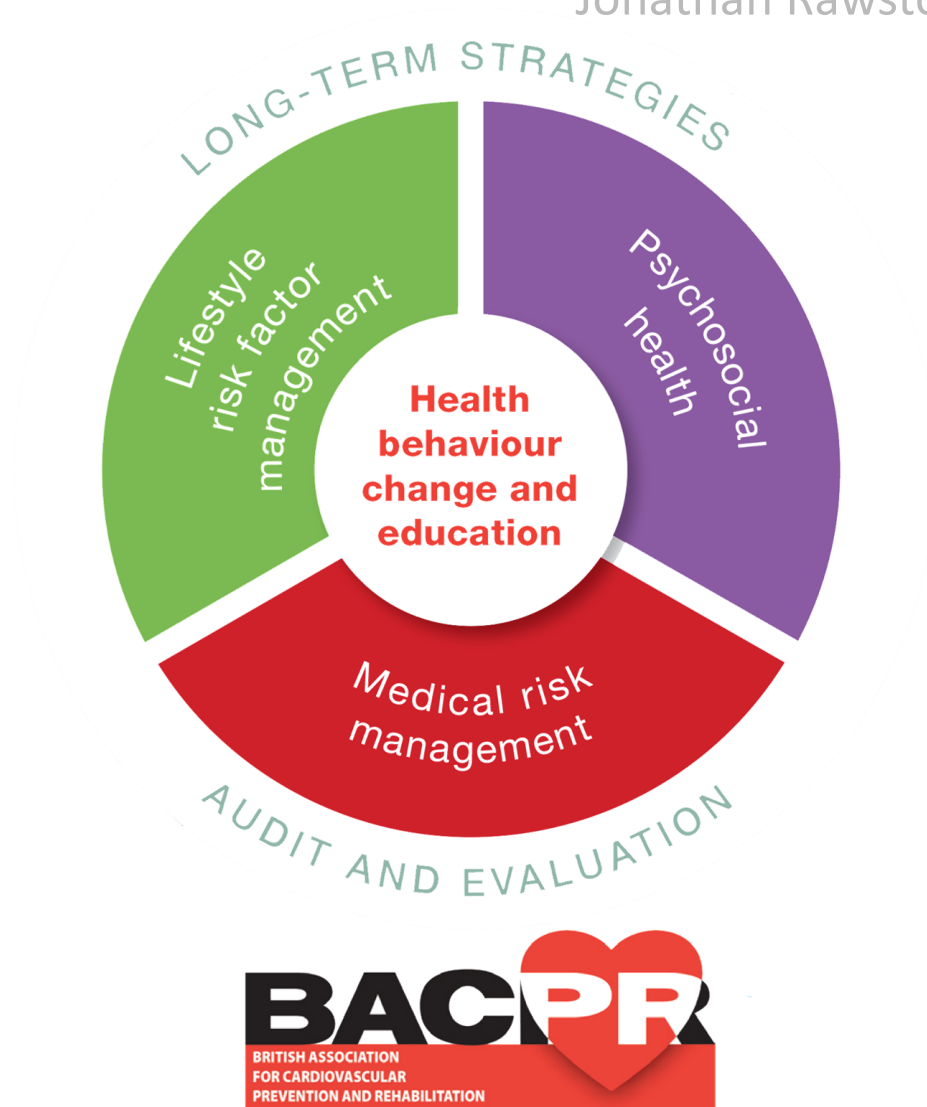
Dr Jonathan Rawstorn  
[jonathan.rawstorn@deakin.edu.au](mailto:jonathan.rawstorn@deakin.edu.au)  
@jrawstorn







Australian Cardiovascular Health  
and Rehabilitation Association



## Core Components

The core components (**Box**) for Australian CR services have been grouped into five areas for service delivery.

1. Referral and access to services
2. Assessment and short-term monitoring
3. Recovery and longer term maintenance
4. Lifestyle/behavioural modification and medication adherence
5. Evaluation and quality improvement



**Cochrane** Database of Systematic Reviews

## Cardiac rehabilitation for people with heart disease: an overview of Cochrane systematic reviews (Review)

Anderson L, Taylor RS

Rehabilitation medicine  
Research

## Is exercise-based cardiac rehabilitation effective? A systematic review and meta-analysis to re-examine the evidence

Richard Powell<sup>1, 2</sup>, Gordon McGregor<sup>1, 3</sup>, Stuart Ennis<sup>1, 4</sup>, Peter K Kimani<sup>5</sup>, Martin Underwood<sup>2</sup>



## Heart, Lung and Circulation

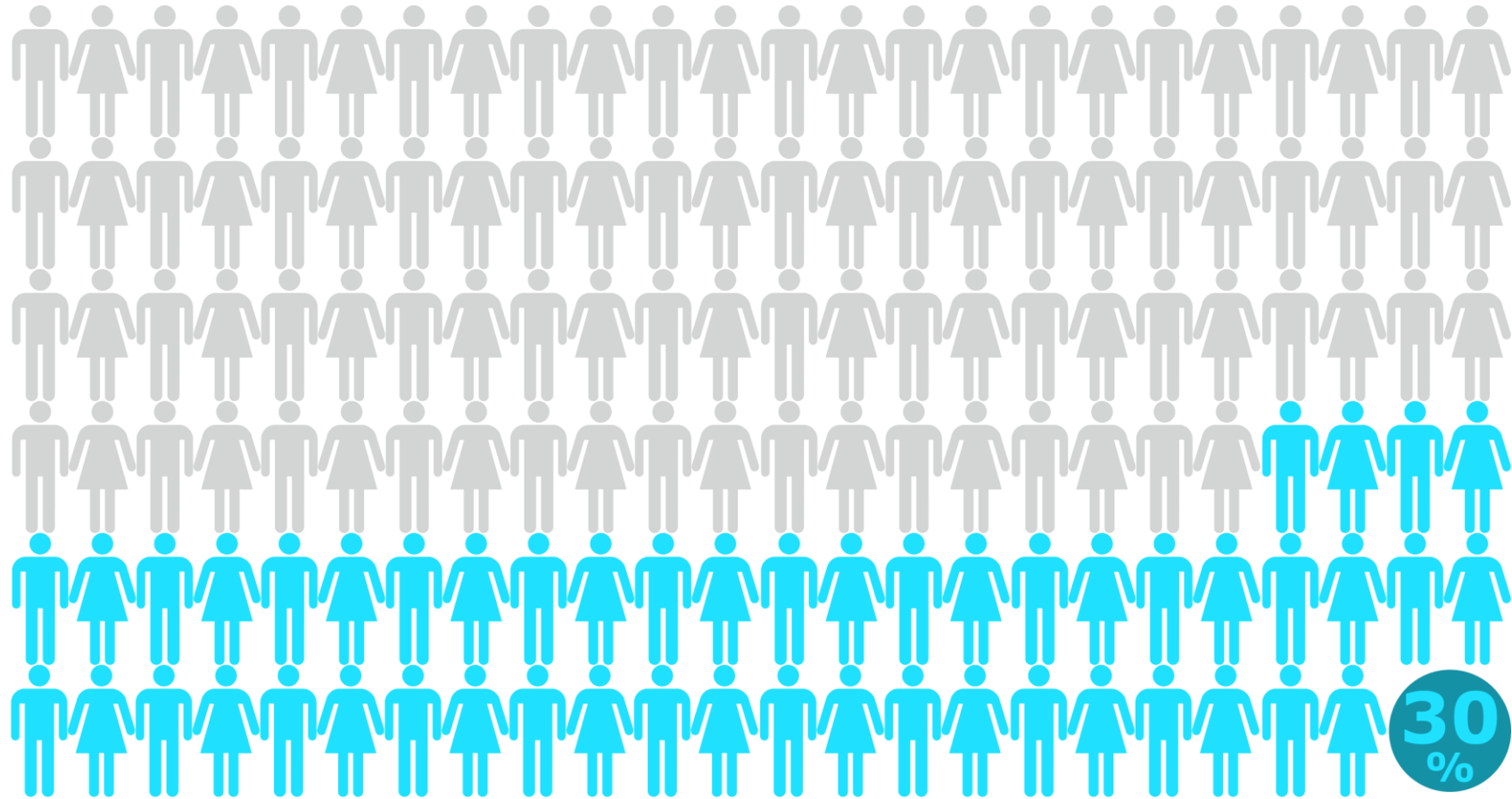
Volume 28, Issue 2, February 2019, Pages 204-206



Commentary

## Making Sense of the Unfavourable Systematic Review of Exercise-Based Cardiac Rehabilitation in the Modern Era: How Should We Proceed?

Bridget Abell BAppSc (HMS-Ex Sci), PhD <sup>a</sup>  , Robert Zecchin RN, MNursing (Cardiac) <sup>b</sup>, Robyn Gallagher RN, PhD <sup>c</sup>



**cr participation**

## European Journal of Preventive Cardiology



**EAPC**  
European Association  
of Preventive Cardiology  
European Society of Cardiology

### Participating in cardiac rehabilitation: a systematic review and meta-synthesis of qualitative data

[Lis Neubeck](#), [S Ben Freedman](#), [Alexander M Clark](#), more...

First Published May 5, 2011 | Review Article | [Find in PubMed](#)  
<https://doi.org/10.1177/1741826711409326>



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## Interventions to promote patient utilisation of cardiac rehabilitation (Review)

Santiago de Araújo Pio C, Chaves GSS, Davies P, Taylor RS, Grace SL



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## Home-based versus centre-based cardiac rehabilitation (Review)

Taylor RS, Dalal H, Jolly K, Zawada A, Dean SG, Cowie A, Norton RJ



## Centre-based programmes

- ☒ Reduced mortality & recurrent events
- ☒ Supervised exercise
- ☒ Broad availability
- ☒ Low participation barriers

## Home-based programmes

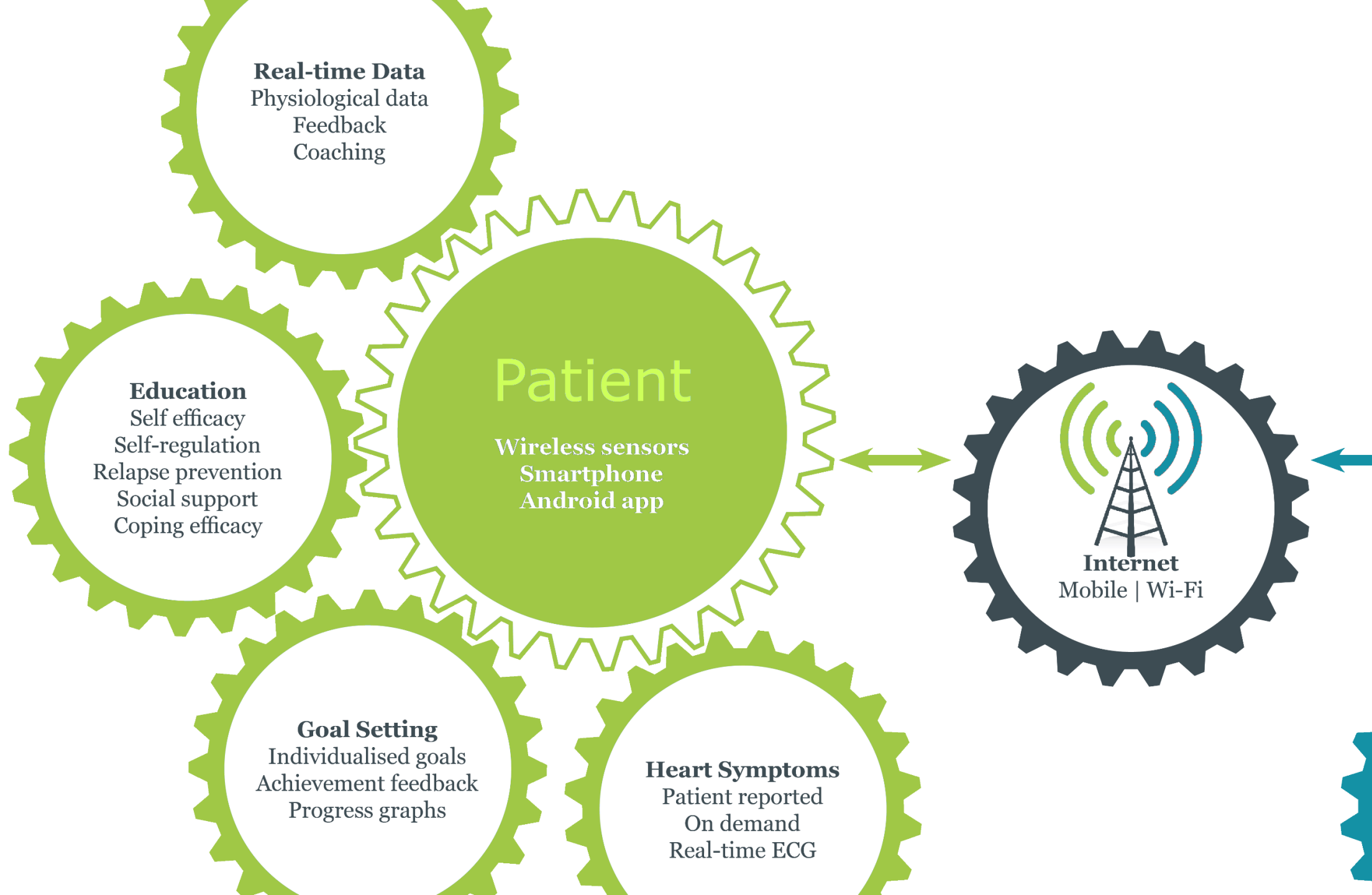
- Reduced mortality & recurrent events ☒
- Supervised exercise ☒
- Broad availability ☒
- Low participation barriers ☒



## REMOTE-CR Platform

Cloud-based  
Connecting patients & clinical experts  
Anywhere | Anytime







Exercise physiologists/scientists  
real-time monitoring + coaching | performance analysis



self-monitoring | real-time data + coach feedback | behavioural support

Participants



## The remote exercise monitoring trial for exercise-based cardiac rehabilitation (REMOTE-CR): a randomised controlled trial protocol

[Ralph Maddison](#) , [Jonathan C Rawstorn](#), [Anna Rolleston](#), [Robyn Whittaker](#), [Ralph Stewart](#), [Jocelyne Benatar](#), [Ian Warren](#), [Yannan Jiang](#) & [Nicholas Gant](#)

[BMC Public Health](#) **14**, Article number: 1236 (2014) | [Cite this article](#)

## Heart

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Cardiac risk factors and prevention  
Original research article





### Effects and costs of real-time cardiac telerehabilitation: randomised controlled non-inferiority trial

[Ralph Maddison](#)<sup>1, 2</sup>,  [Jonathan Charles Rawstorn](#)<sup>1, 2</sup>, [Ralph A H Stewart](#)<sup>3</sup>, [Jocelyne Benatar](#)<sup>3</sup>,  [Robyn Whittaker](#)<sup>2</sup>, [Anna Rolleston](#)<sup>4</sup>,  [Yannan Jiang](#)<sup>2</sup>, [Lan Gao](#)<sup>5</sup>, [Marj Moodie](#)<sup>5</sup>, [Ian Warren](#)<sup>6</sup>, [Andrew Meads](#)<sup>6</sup>,   
[Nicholas Gant](#)<sup>7</sup>

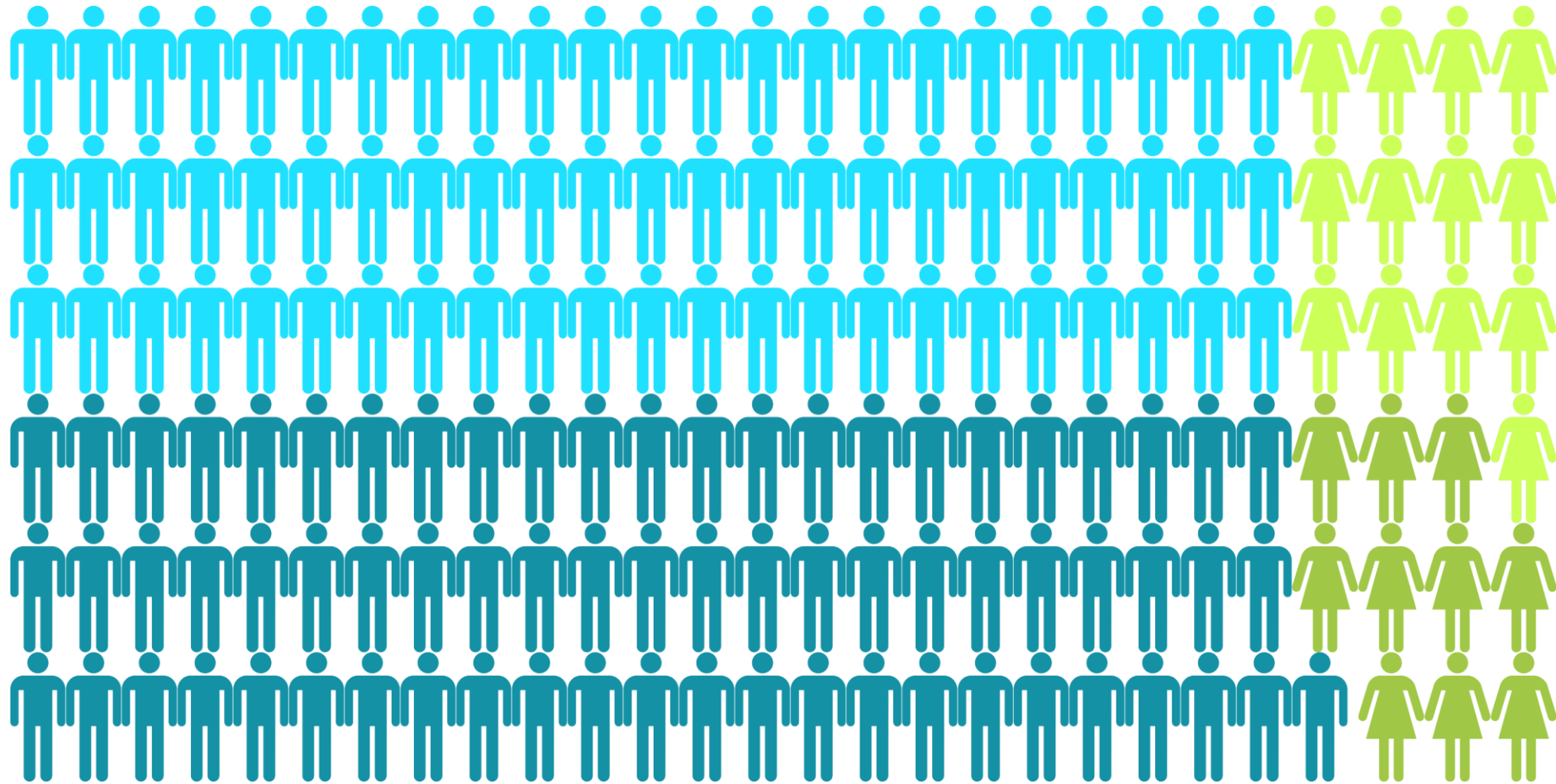
## Archives of Physical Medicine and Rehabilitation

**BRIEF REPORT** | [VOLUME 99, ISSUE 11, P2373-2377, NOVEMBER 01, 2018](#)

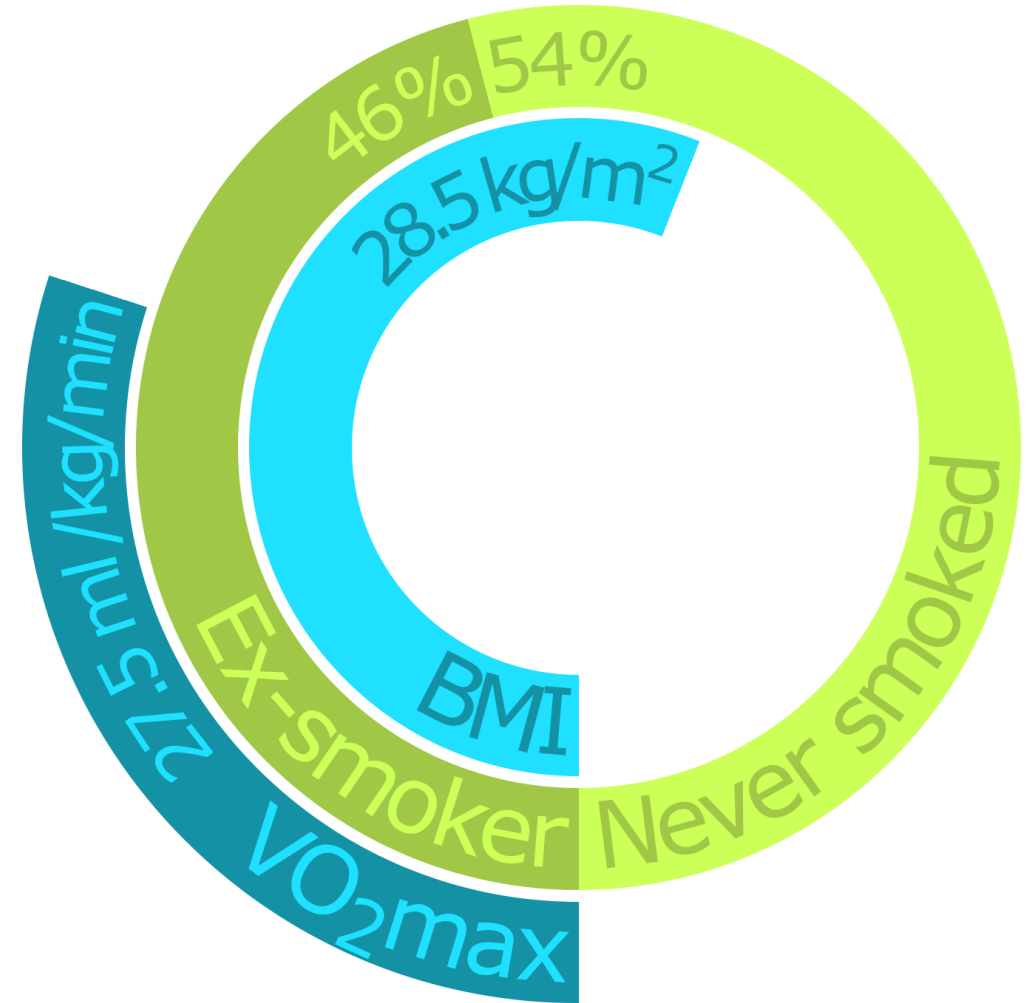
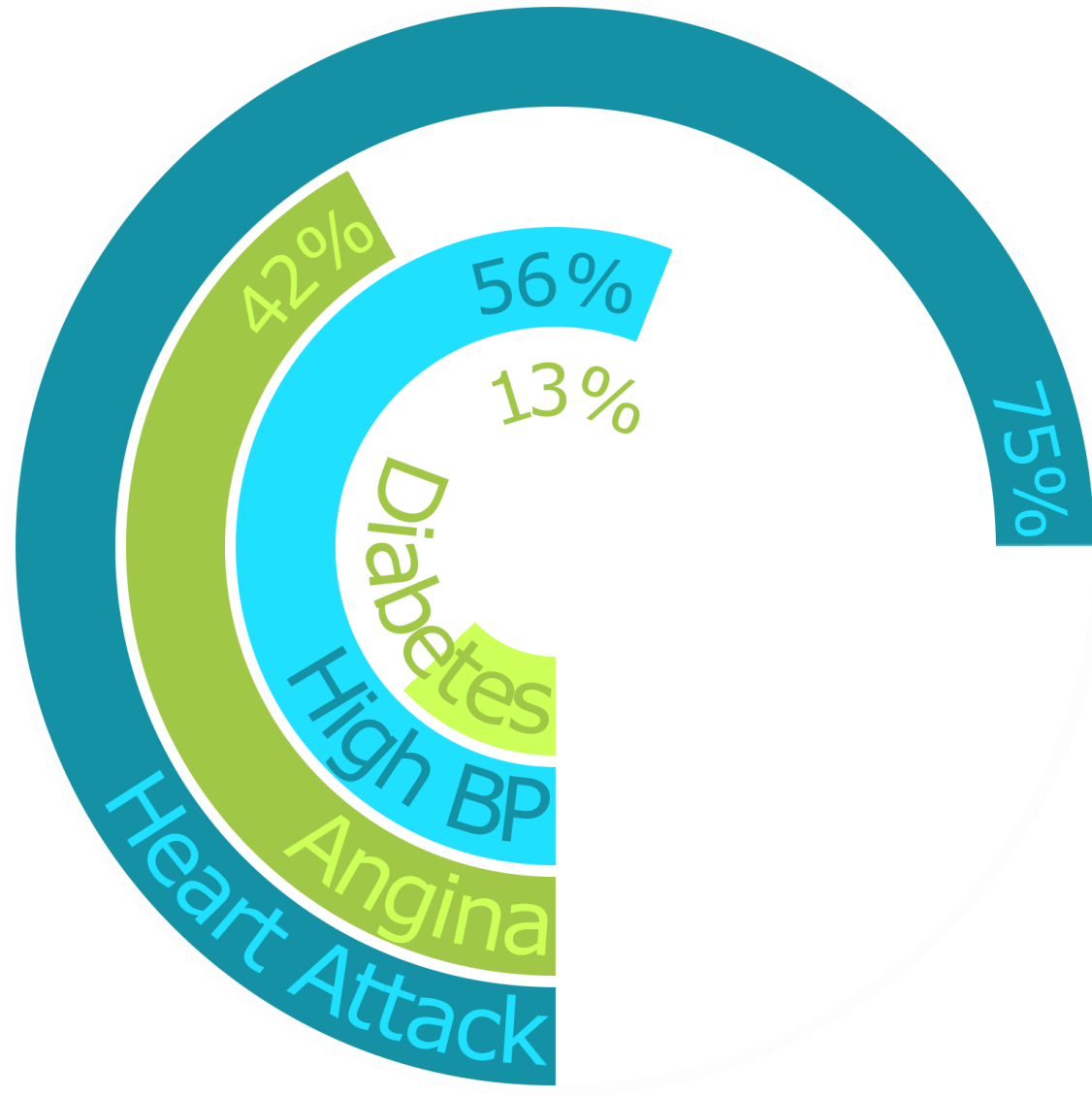
### End Users Want Alternative Intervention Delivery Models: Usability and Acceptability of the REMOTE-CR Exercise-Based Cardiac Telerehabilitation Program

[Jonathan C. Rawstorn, PhD](#)   • [Nicholas Gant, PhD](#) • [Anna Rolleston, PhD](#) • ... [Andrew Meads, PhD](#) • [Yannan Jiang, PhD](#) • [Ralph Maddison, PhD](#) • [Show all authors](#)

## Telerehabilitation



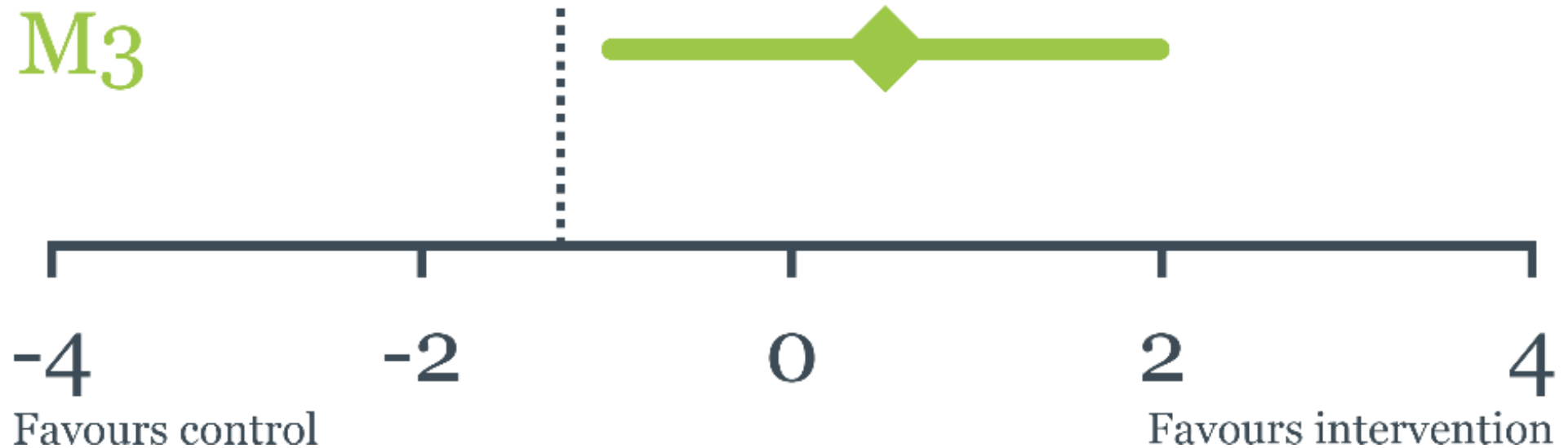
## Centre-based rehabilitation





# Exercise capacity ( $\text{VO}_2$ ml/kg/min)

M<sub>3</sub>



# Systolic blood pressure (mm Hg)

M3

M6



# Diastolic blood pressure (mm Hg)

M3

M6



# Hip circumference (cm)

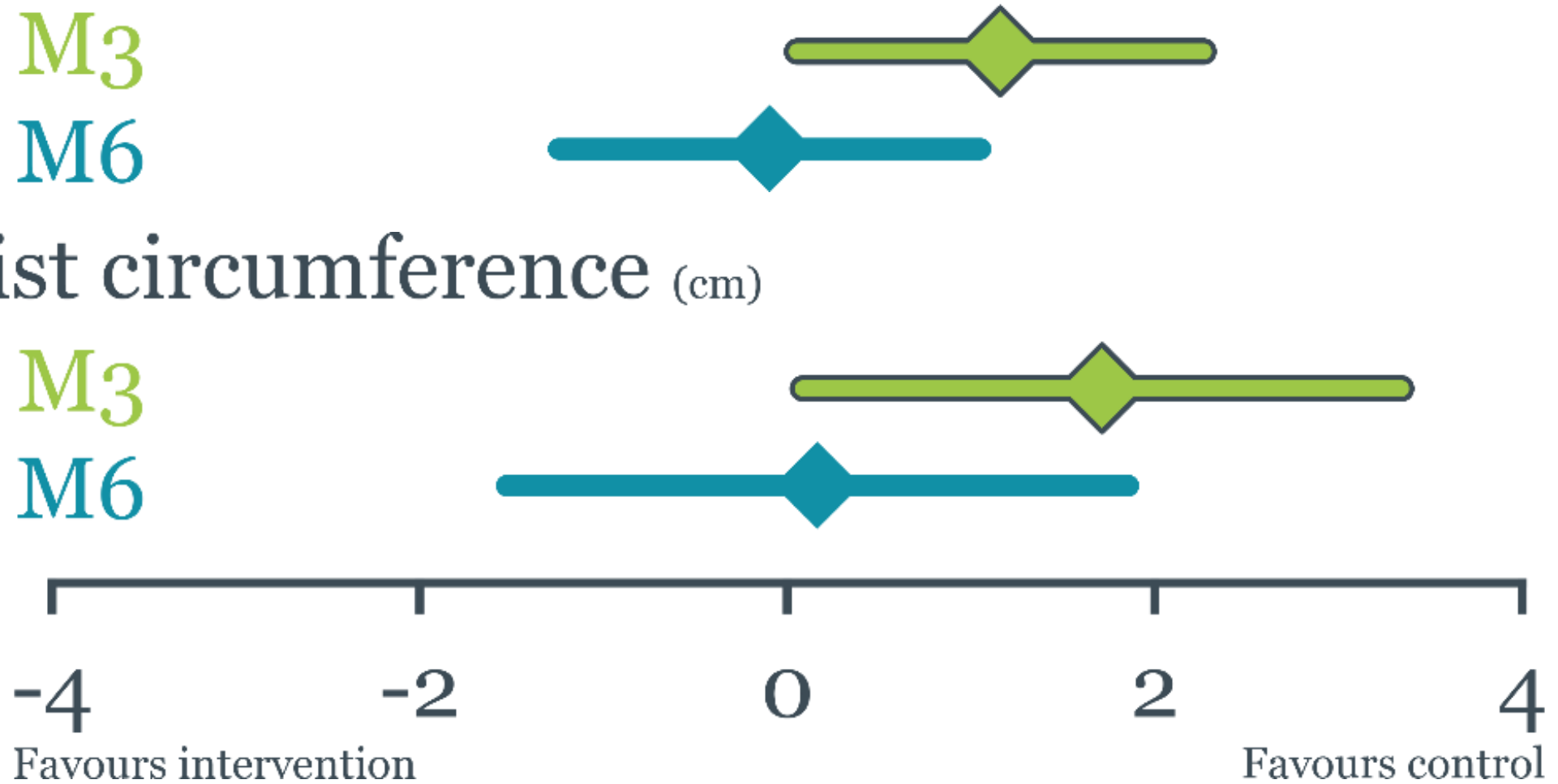
M3

M6

# Waist circumference (cm)

M3

M6



Total cholesterol (mmol/L)

M<sub>3</sub>



LDL cholesterol (mmol/L)

M<sub>3</sub>



HDL cholesterol (mmol/L)

M3



Triglyceride (mmol/L)

M3



**centre-based**



**remote-cr**

**remote-cr**

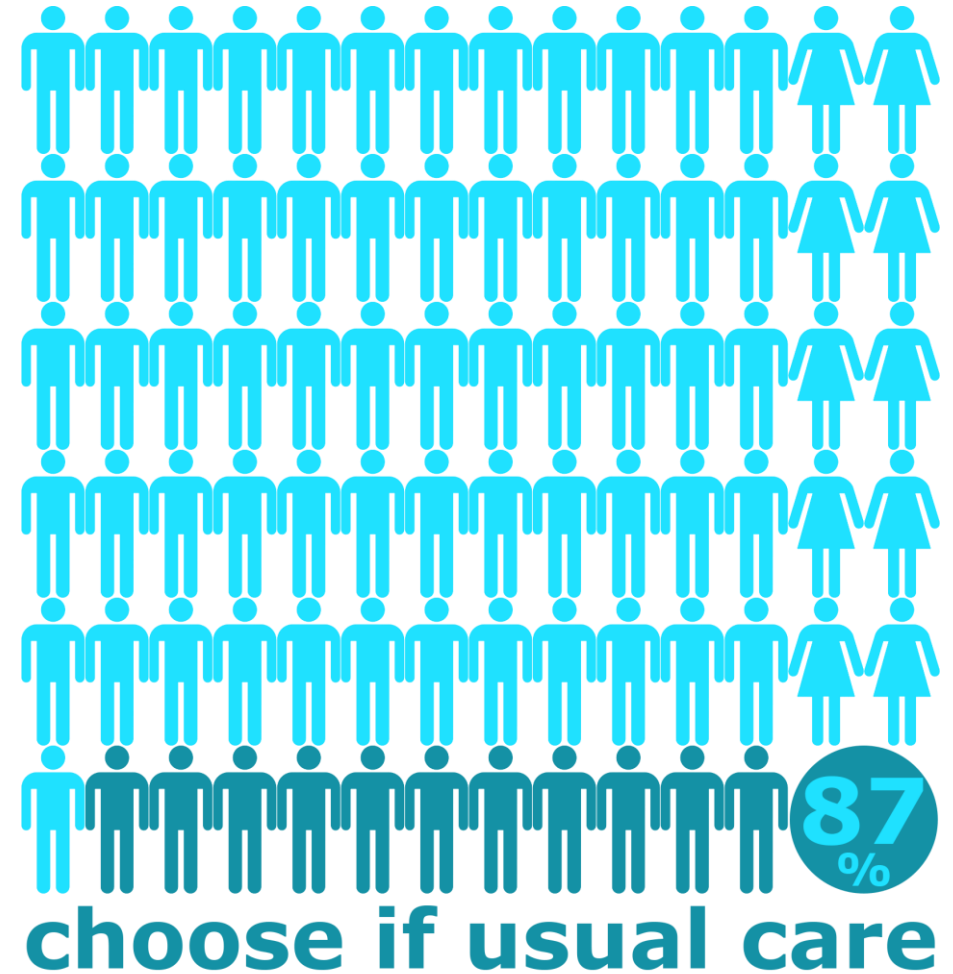


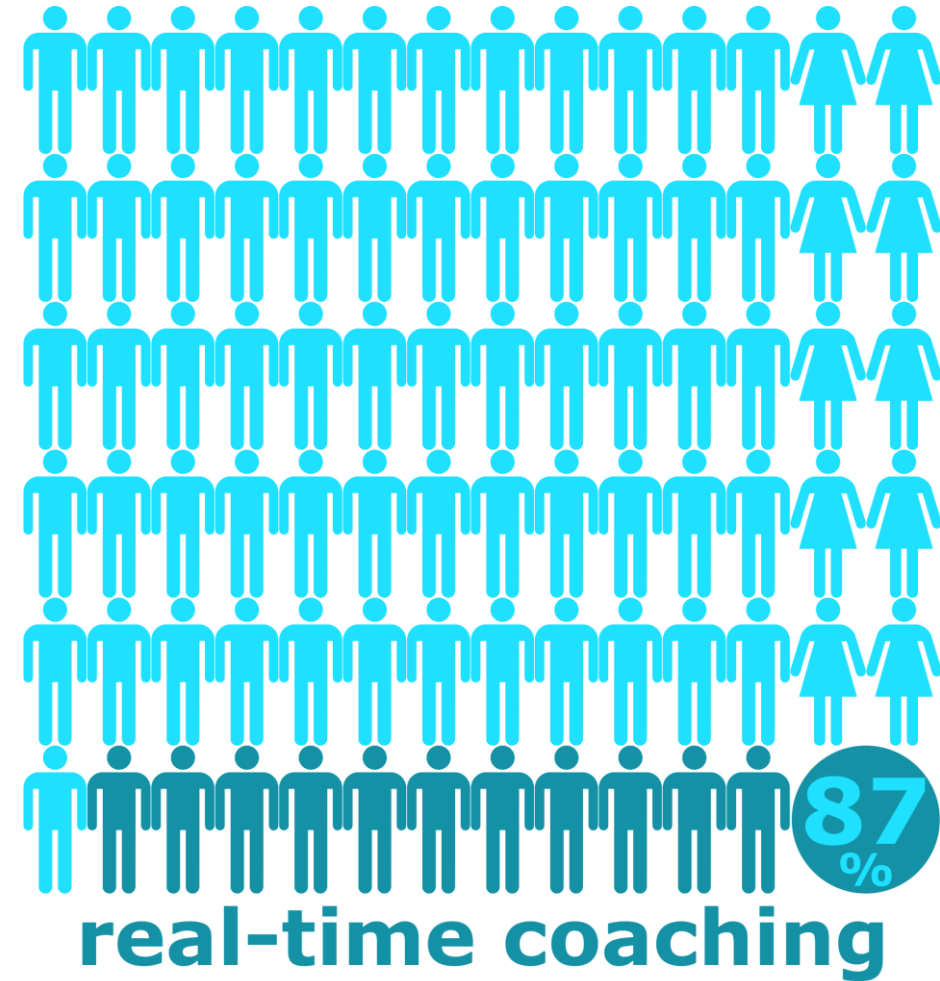
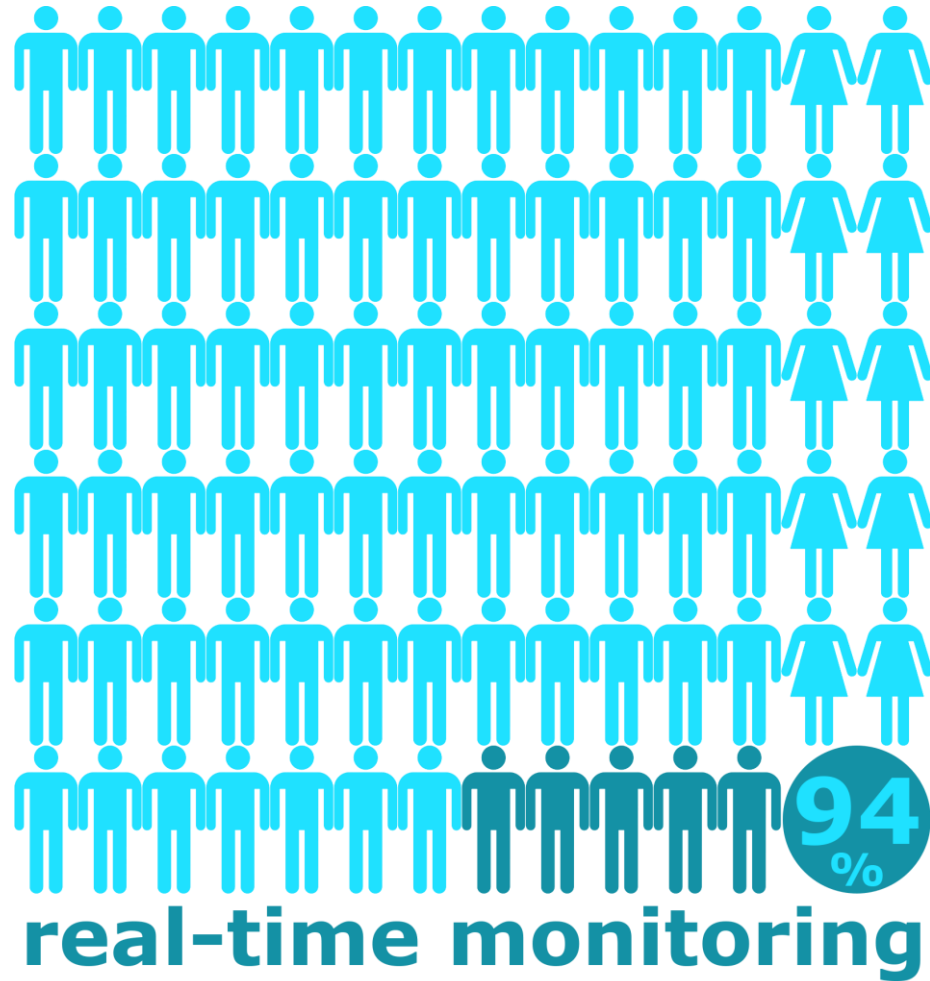
**lease**

**centre-based**

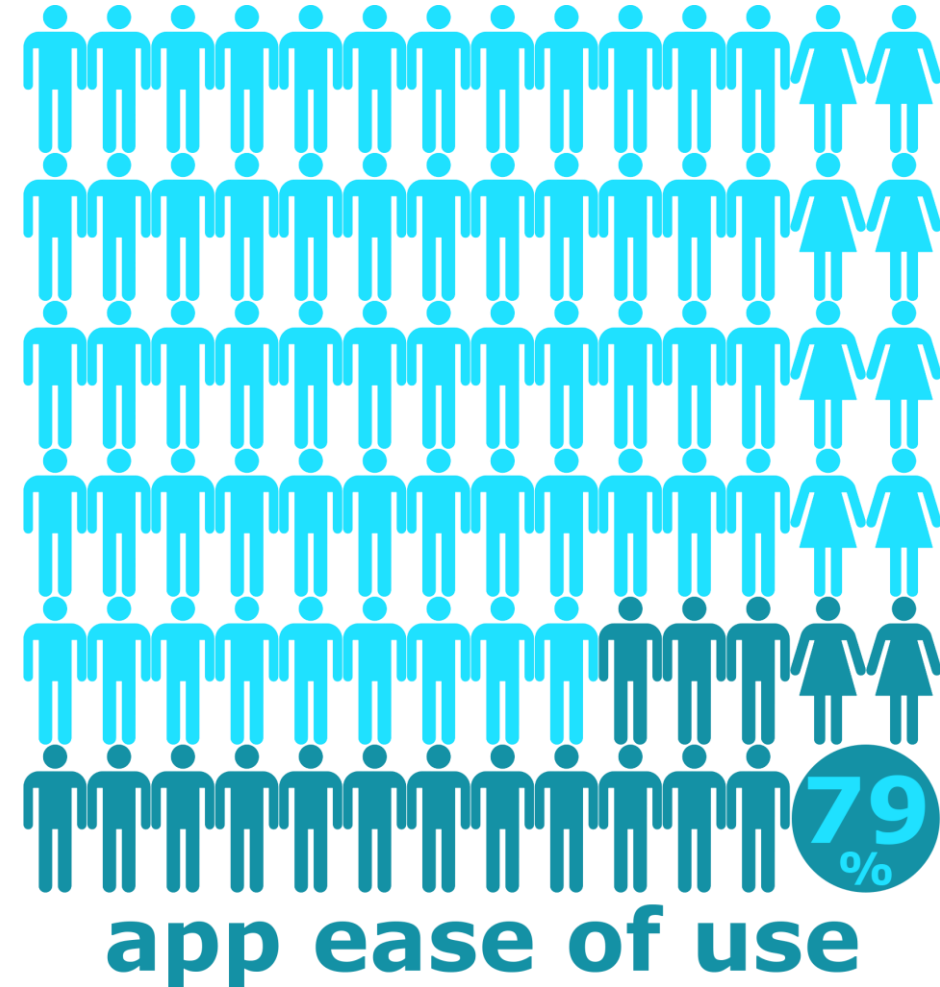
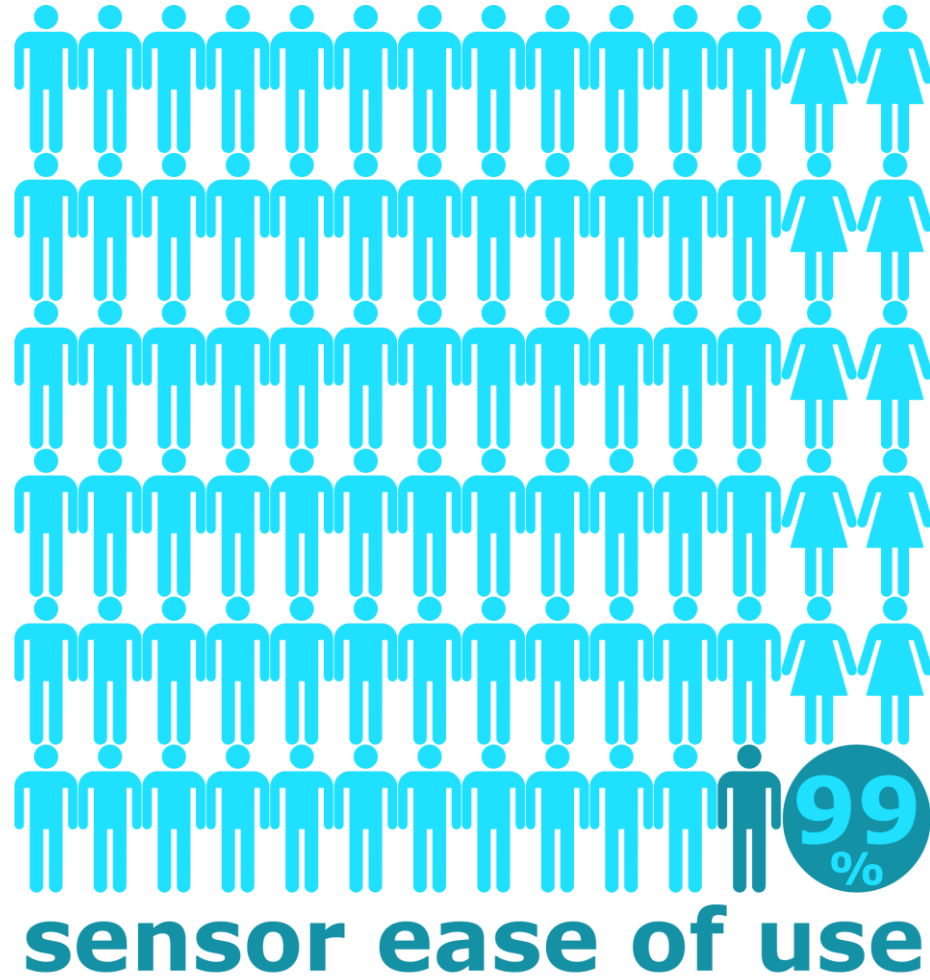


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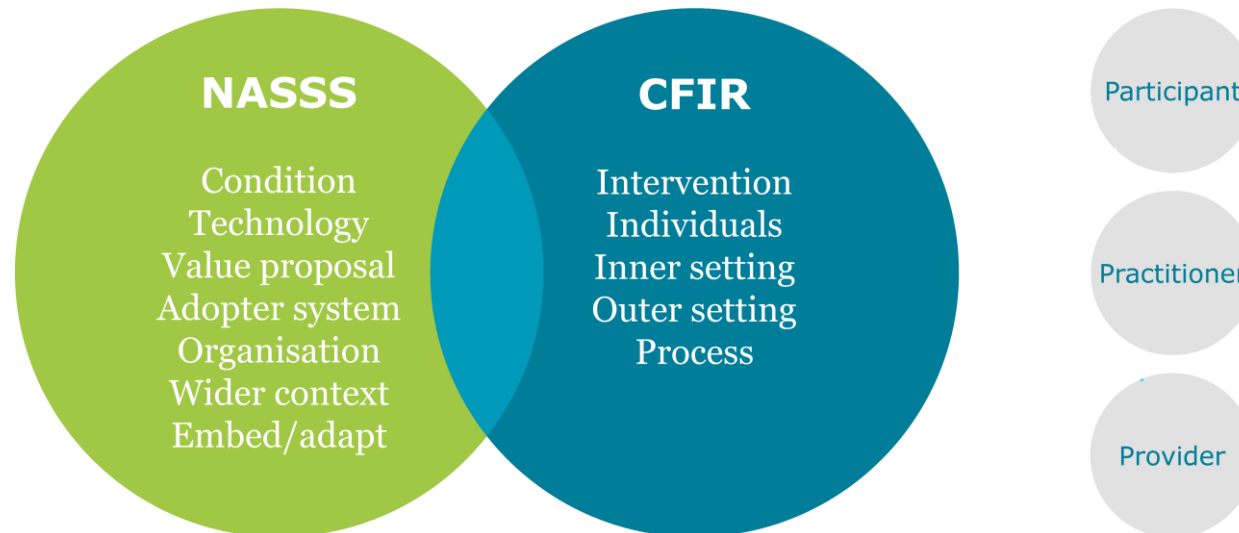
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# Smartphone Cardiac Rehabilitation, Assisted Self-Management Versus Usual Care: Protocol for a Multicenter Randomized Controlled Trial to Compare Effects and Costs Among People With Coronary Heart Disease



[what's this?](#)

Jonathan Charles Rawstorn<sup>1</sup>, PhD  ; Kylie Ball<sup>1</sup>, PhD  ; Brian Oldenburg<sup>2</sup>, PhD  ; Clara K Chow<sup>3</sup>, MBBS, PhD  ;  
Sarah A McNaughton<sup>1</sup>, PhD  ; Karen Elaine Lamb<sup>1</sup>, PhD  ; Lan Gao<sup>4</sup>, PhD  ; Marj Moodie<sup>4</sup>, PhD  ;  
John Amerena<sup>5</sup>, MBBS  ; Voltaire Nadurata<sup>6</sup>, MD  ; Christopher Neil<sup>7</sup>, MBBS, PhD  ; Stuart Cameron<sup>8</sup>, BAppSc  ;  
Ralph Maddison<sup>1</sup>, PhD 



# Thanks for your attention!

