



Government of Western Australia
North Metropolitan Health Service
Sir Charles Gairdner Osborne Park Health Care Group



Is home-based exercise training as effective as a supervised exercise training program for people with CVD?

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Background

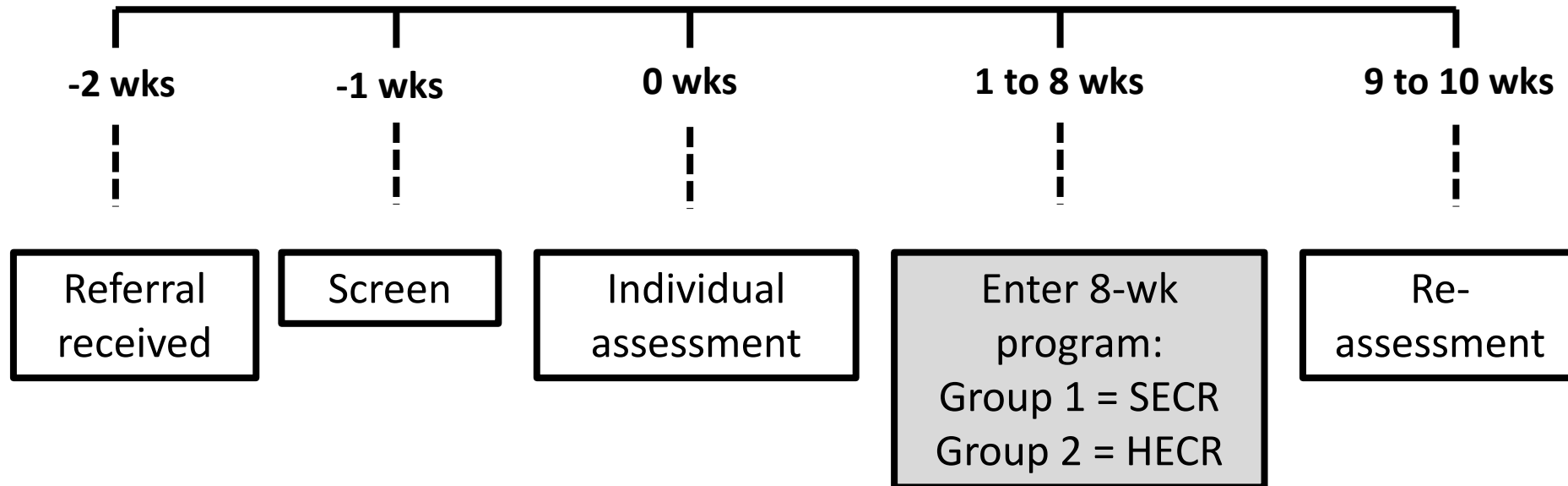
- Exercise-based cardiac rehabilitation (CR):
 - ↓ cardiovascular disease (CVD) mortality 25%
 - ↓ hospitalisations
 - Improves CVD risk factors
 - ↑ quality of life (QoL)
- Hospital setting → barriers
- Snapshot 2012 - 27% referred
- Limited evidence alternate models of CR
 - Home-based

Aim

- Compare clinical outcomes following 8-wk supervised hospital-based exercise CR (SECR) program vs home-based exercise CR (HECR) program in patients with CVD:
 - Functional exercise capacity: 6-minute walk distance (6MWD)
 - Waist circumference (cm)
 - Body weight (kg)
 - Body mass index (BMI kg m⁻²)

Method: study design

- Prospective observational 2 group



SECR = Supervised hospital-based exercise CR program

HECC = Home-based exercise CR program

Participants

- **Inclusion:**
 - CAD
 - ACS
 - post-CABG
 - post-PCI
- **Exclusion:**
 - Co-morbidity that compromised safety during assessment (e.g., hypertension)
 - Severe musculoskeletal/neurological/cognitive limitations
 - Current untreated cardiac or other medical condition

Intervention

All offered outpatient group education + CR nurse phone follow-up.

SECR	HECR
<p>2 x wk, 8-wks Aerobic training Walking</p> <ul style="list-style-type: none">• 10 min @ 80% av speed of 6MWT <p>Cycling</p> <ul style="list-style-type: none">• 10 min, intervals (1:1 ratio) <p>Resistance training</p>	<p>Most days, 8-wks Aerobic training Walking ± Cycling/other</p> <ul style="list-style-type: none">• 150-300 min mod/wk <p>Resistance training</p>

No serious adverse events

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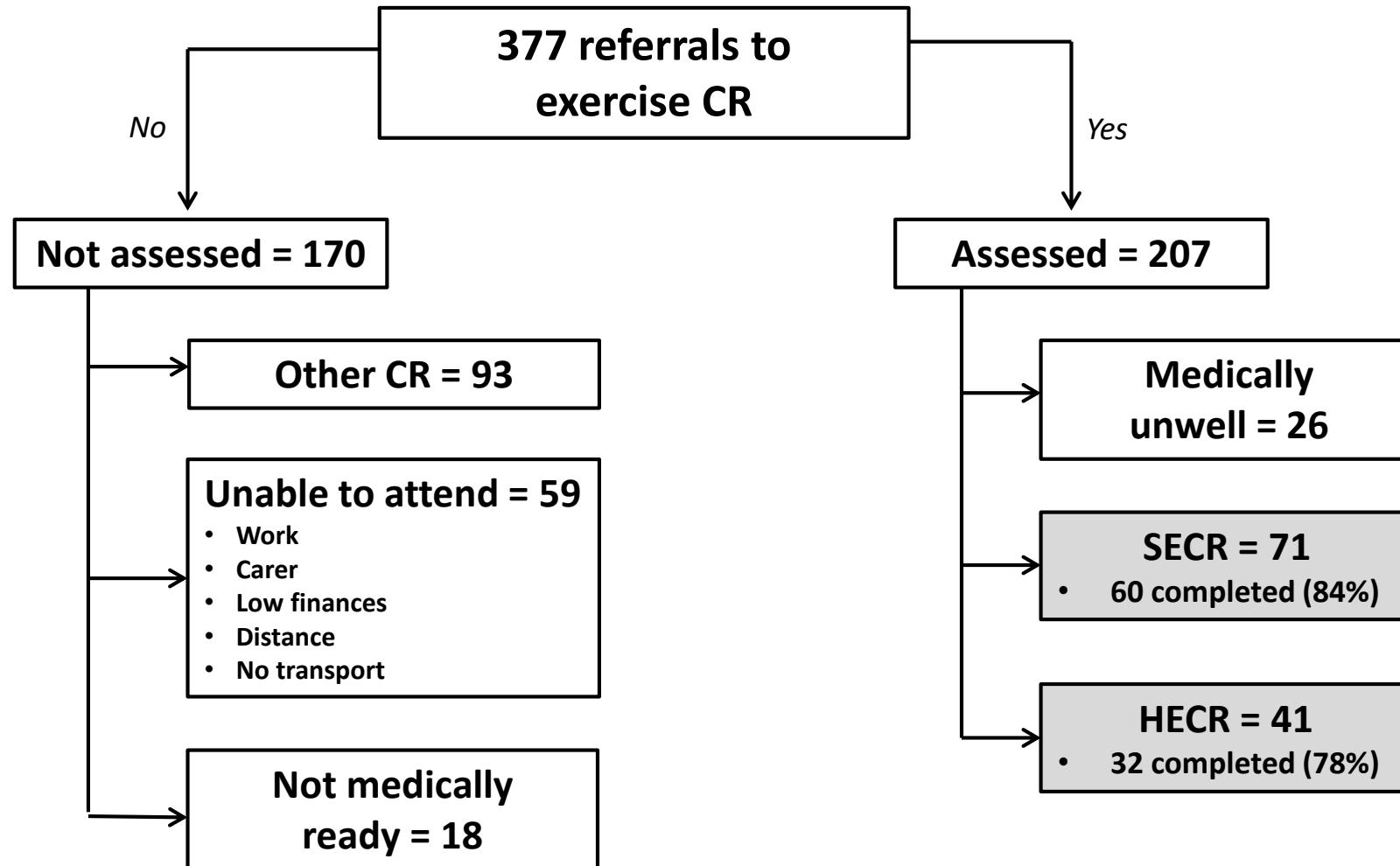
No serious adverse events

Outcome measures

- Functional exercise capacity (6MWD)
 - 6MWT – standard protocol, screening and termination criteria
- Waist circumference (cm)
- Body weight (kg)
- Body mass index (BMI kg m⁻²)

- Statistical analysis (SPSS v22)
 - Data expressed as mean \pm *SD* or 95% CI.
 - Paired and independent t-tests

Participants



Results: Baseline characteristics

	Whole group (n = 92)	SECR (n = 60)	HECR (n = 32)	p value
Age (yrs)	62 ± 13	64 ± 12	59 ± 13	n/s
Waist (cm)	104 ± 9	103 ± 10	106 ± 8	n/s
Weight (kg)	84 ± 15	83 ± 15	86 ± 15	n/s
BMI (kg m⁻²)	28 ± 5	27 ± 5	29 ± 5	n/s
Pre 6MWD (m)	564 ± 95	554 ± 104	583 ± 74	n/s
%predicted 6MWD	83 ± 12	83 ± 13	84 ± 10	n/s

No difference between gender

Functional exercise capacity

	Pre 6MWD (m)	Post 6MWD (m)	Mean diff (95% CI)	p
Whole group (n =92)	564 ± 95	612 ± 95	48 ± 56 (36 to 59)	p < 0.0001
SECR (n =60)	554 ± 104	616 ± 96	62 ± 50 (48 to 74)*	p < 0.0001
HECR (n = 32)	583 ± 74	605 ± 94	22 ± 58 (2 to 43)	n/s

Mean ± SD (95% CI)

*Change > MID = 25m (CAD)

Waist, Weight and BMI

Whole group (n = 92)	Pre- program	Post- program	Mean diff (95% CI)	p
Waist (cm)	104 ± 9	102 ± 10	1.5 ± 4 (0.7 to 2.3)	p < 0.0001
Body weight (kg)	84 ± 15	83 ± 15	0.8 ± 3 (0.2 to 1.3)	p < 0.0001
BMI (kg m ⁻²)	28 ± 5	27 ± 5	0.4 ± 1 (0.2 to 0.6)	p = 0.009

No between group differences

Discussion

- Participants who completed SECR had greater improvements in functional exercise capacity than HECR
- Good adherence in SECR (84% completion)
- HECR outcomes might improve with additional support delivered to their home (throughout program)

Strengths

- Prospective vs retrospective
- Standardised test procedures pre and post program

Limitations

- Participant selection bias
- Only short-term follow-up
- Risk factor analysis and QoL not included

Recommendation

- RCT
- SECR vs HECD vs other

Acknowledgements

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 - Nola Cecins
 - Abbey Sawyer
 - Sue Jenkins
 - SCGH Physiotherapy Department
 - CR & HF teams

- No conflicts of interest to declare

References

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Appendices

Why HECCR?

- **Responses:**

- I exercise 3-5 days wk/ attend private gym/own home gym equipment [13 responses]
- Work full-time [12 responses]
- Distance/long travel time [9 responses]
- Family/carer commitments [2 responses]
- Other medical condition [2 responses]
- Too busy [2 responses]
- Financial problems [2 responses]
- Unable to state reason [2 responses]

(1) SECR and (2) HECR groups

(1) Supervised gym

- 2 x week, 8-weeks
- Walking
 - Duration: 10 min
 - Intensity 80% av speed of 6MWT or a RPE 12-14/20
- Cycling
 - Duration: 10 min
 - Intervals for 2-4 min (1:1 ratio)
 - RPM and wattage
- Resistance training
 - UL, LL, machines, free weights and body exercises
- Progression
 - 10% every 1 to 2 weeks
- Home program on 2 or 3 days

(2) Home-based

- Most days of the week
- Aerobic training
 - Duration: individual
 - Intensity: “moderate” RPE 12-14/20
- Resistance training
 - Frequency: 2 non-con days
 - UL & LL strength/endurance (10-20 reps, 1-2 sets)
 - Mode: Availability, free weights, body weight, machines
- Progression
 - 10% every 1 to 2 weeks
- Education
 - Cessation

No adverse events

CVD risk factors

Risk Factors		Initial Assessment		Re-Assessment	
Lifestyle & Behavioural					
<input type="checkbox"/> Smoking	QUIT advice Pharmacotherapy for > 10 cigarettes/day				
<input type="checkbox"/> Nutrition	Saturated/trans fats intake < 8% of total energy intake				
<input type="checkbox"/> Alcohol	< 2 standard drinks per day for men < 1 standard drink per day for women				
<input type="checkbox"/> Physical activity	150 minutes of moderate intensity aerobic exercise per week				
<input type="checkbox"/> Healthy weight	Waist < 94cm men or < 80cm women BMI 18.5-24.5 kg/m ²	Waist:Hip	Weight	Waist:Hip	Weight
		Height	BMI	Height	BMI
Biomedical					
<input type="checkbox"/> Lipids	Total cholesterol < 4.0mmol/L Triglycerides < 1.5mmol/L HDL > 1.0mmol/L LDL < 2.0 mmol/L Cholesterol/HDL ratio < 3.5				
<input type="checkbox"/> Blood pressure	< 140/90 mmHg				
<input type="checkbox"/> Diabetes	HbA1c < 7% BGL 3.4-5.4 mmol/L				
Psychological & Social support					
<input type="checkbox"/> Stress	Cortisol = ↓ immune response & vasoconstrictor				
<input type="checkbox"/> Depression	PHQ – 2 & 9				

5. CRSP pathway principles

