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The Role of Exercise in Managing Atrial Fibrillation

Exercise Physiology and
Cardiovascular Health Lab

Jennifer Reed, RKin, PhD

Scientist, Director, Exercise Physiology and Cardiovascular Health Lab, Division of Cardiac Prevention and Rehabilitation, University of Ottawa Heart Institute

Assistant Professor, School of Epidemiology and Public Health, Faculty of Medicine, University of Ottawa

Adjunct Professor, School of Human Kinetics, Faculty of Health Sciences, University of Ottawa

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Clinical Management of Atrial Fibrillation

Improving Quality of Life

+

Reducing Symptom Burden

RATE CONTROL

RHYTHM CONTROL

ANTICOAGULATION MEDICATION

Aliot et al. 2010. Europace. 12: 626-633

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Systematic Reviews: State of the Literature on Exercise and Atrial Fibrillation

Canadian Journal of Cardiology 29 (2013) 483–491

Systematic Review/Meta-analysis

A Systematic Review of the Health Benefits of Exercise Rehabilitation in Persons Living With Atrial Fibrillation

Nicholas B. Giacomantonio, MD,[a,b] Shannon S.D. Bredin, PhD,[c,d] Heather J.A. Foulds, MSc,[d,e,f] and Darren E.R. Warburton, PhD[d,e,f]

Canadian Journal of Cardiology 29 (2013) 1721–1728

Systematic Review/Meta-analysis

The Effects of Chronic Exercise Training in Individuals With Permanent Atrial Fibrillation: A Systematic Review

Jennifer L. Reed, PhD, Amy E. Mark, PhD, Robert D. Reid, PhD, MBA, and Andrew L. Pipe, MD, CM

Minto Prevention and Rehabilitation Centre, University of Ottawa Heart Institute, Ottawa, Ontario, Canada

Cochrane Library

Cochrane Database of Systematic Reviews

Exercise-based cardiac rehabilitation for adults with atrial fibrillation (Review)

Risom SS, Zwisler AD, Johansen PP, Sibilitz KL, Lindschou J, Gluud C, Taylor RS, Svendsen JH, Berg SK

Canadian Journal of Cardiology 34 (2018) S284–S295

Systematic Review/Meta-analysis

The Effects of Cardiac Rehabilitation in Patients With Atrial Fibrillation: A Systematic Review

Jennifer L. Reed, RKin, PhD,[a,b,c,d] Tasuku Terada, PhD,[a,b] Daniele Chirico, PhD,[a,b] Stephanie A. Prince, PhD,[b] and Andrew L. Pipe, CM, MD[b,c]

[a] *Exercise Physiology and Cardiovascular Health Lab, University of Ottawa Heart Institute, Ottawa, Ontario, Canada*
[b] *Division of Cardiac Prevention and Rehabilitation, University of Ottawa Heart Institute, Ottawa, Ontario, Canada*
[c] *University of Ottawa, Faculty of Medicine, Ottawa, Ontario, Canada*
[d] *School of Human Kinetics, Faculty of Health Sciences, University of Ottawa, Ontario, Canada*

Open access Meta-analysis

openheart

Exercise-based cardiac rehabilitation improves exercise capacity and health-related quality of life in people with atrial fibrillation: a systematic review and meta-analysis of randomised and non-randomised trials

Neil A Smart,[1] Nicola King,[2] Jeffrey D Lambert,[3] Melissa J Pearson,[1] John L Campbell,[3] Signe S Risom,[4,5] Rod S Taylor[3,6]

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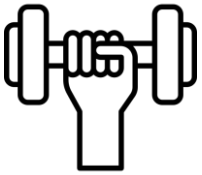
Physical and Mental Health Benefits of Exercise Training in Atrial Fibrillation

Peak aerobic power

Functional capacity



Strength (N)

Power (W)

Activities of daily living

Quality of life

Cardiac function

Symptom burden

Giacomantonio et al. 2013. CJC. 29:483-491; Reed et al. 2013. CJC. 20:1721-1728; Risom et al. 2017. Cochrane Systematic Reviews. 2:CD011197; Reed et al. 2018. CJC. 34:S284-S295; Smart et al. 2018. OpenHeart. 20:5(2):e000880

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FITT Approach for Atrial Fibrillation

PRACTICE CMAJ

FIVE THINGS TO KNOW ABOUT ...

Exercise training in patients with paroxysmal, persistent or permanent atrial fibrillation

Jennifer L. Reed PhD MEd CS, David H. Birnie MB ChB MD, Andrew L. Pipe CM MD

Reed et al. 2014. CMAJ. 186(14): E558

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FITT Approach for Atrial Fibrillation

- **F**requency: ≥3 days/week
- **I**ntensity: moderate (heart rates of 90-115 beats/minute; 64%-76% of peak oxygen consumption)*
- **T**ime: ≥60 minutes per session
- **T**ype: activities that use large muscle groups (e.g., walking, jogging, rowing, cycling)

** Talk-Test for moderate-intensity exercise: patients should exercise at an intensity that permits simple conversation.*

Reed et al. CMAJ 2014: 186(14): E558

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Clinical Guidelines for the Management of AF

Some guidelines for the management of patients with AF have recently included recommendations for exercise training

ELSEVIER
Canadian Journal of Cardiology
Available online 22 October 2020
In Press, Uncorrected Proof

Society Guidelines

The 2020 Canadian Cardiovascular Society/Canadian Heart Rhythm Society Comprehensive Guidelines for the Management of Atrial Fibrillation

ESC
European Society of Cardiology
European Heart Journal (2020) 00, 1–126
doi:10.1093/eurheartj/ehaa612
ESC GUIDELINES

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS)

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Canadian Guidelines for the Management of AF

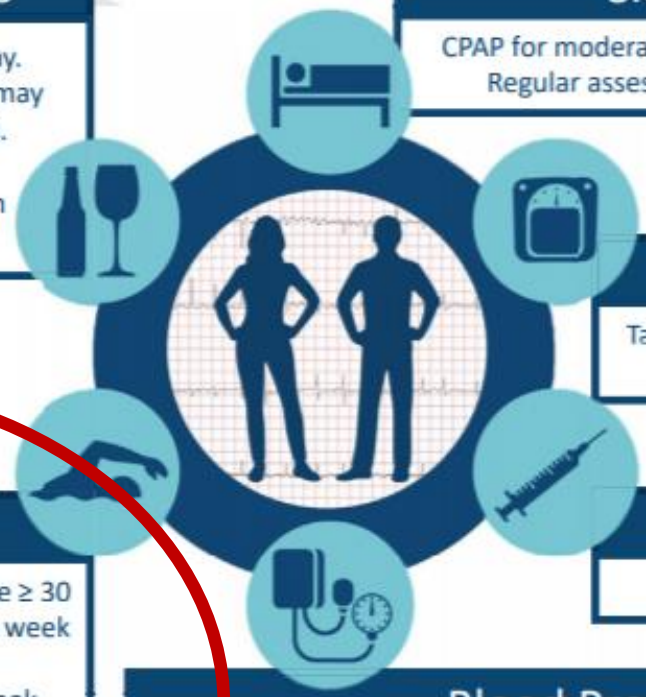
Alcohol and Tobacco

Limit to ≤ 1 standard drink[1] per day. Complete abstinence from alcohol may be preferred in selected patients.

Target complete abstinence from tobacco-related products.

Sleep Apnea

CPAP for moderate-severe OSA (AHI ≥ 15/hour)
Regular assessment of CPAP adherence.



Weight Loss

Target a weight loss of ≥ 10% to a BMI of less than 27 kg/m^2.

Exercise

1. Moderate intensity aerobic exercise ≥ 30 minutes a day at least 3-5 days per week (target ≥ 200 minutes weekly).
2. Resistance exercise 2-3 days per week.
3. Flexibility exercises at least 10 minutes per day at least 2 days per week in those > 65 years of age.

Diabetes

Target a HbA1c of ≤ 7.0%.

Blood Pressure

Target ≤ 130/80 mm Hg at rest and ≤ 200/100 mm Hg at peak exercise.
ACE-I or ARB may be preferred.

[1]defined as containing 14 g of alcohol; 44 mL (1.5 fluid oz.) of 80-proof liquor, 148 mL (5 fluid oz.) of wine or 355 mL (12 fluid oz.) of beer

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High-Intensity Interval Training (HIIT)

- Form of exercise in which individuals alternate periods of short duration, intense work with less intense recovery periods

- Brief, effective and efficient mode of exercise

- Traditionally used to train athletes requiring high levels of fitness (e.g. track, team sport athletes)

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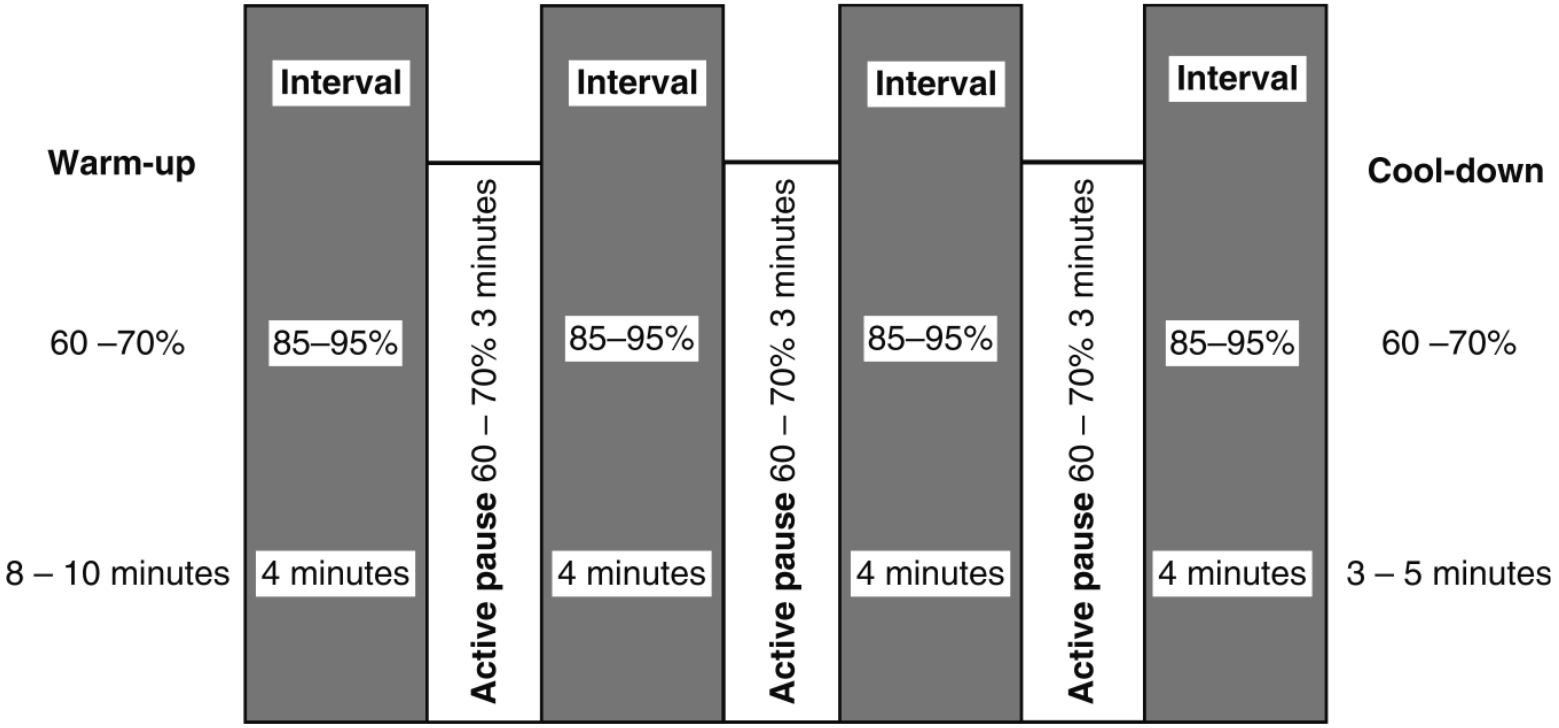
High-Intensity Interval Training (HIIT)



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What is the Research Showing?

Superior effects of HIIT vs. **m**oderate **i**ntensity **c**ontinuous **e**xercise **t**raining (MICT, standard care for cardiac rehabilitation) in patients with CAD and HF:

- VO_{2peak}
- Peak power
- Resting and submaximal heart rates
- Blood pressure
- Left ventricular filling speed and diastolic relaxation
- High-density lipoprotein, triglycerides
- Fasting glucose levels
- Mental health (quality of life)
- Motivation

Pattyn et al. 2018. Sports Med. 48(5):1189-1205

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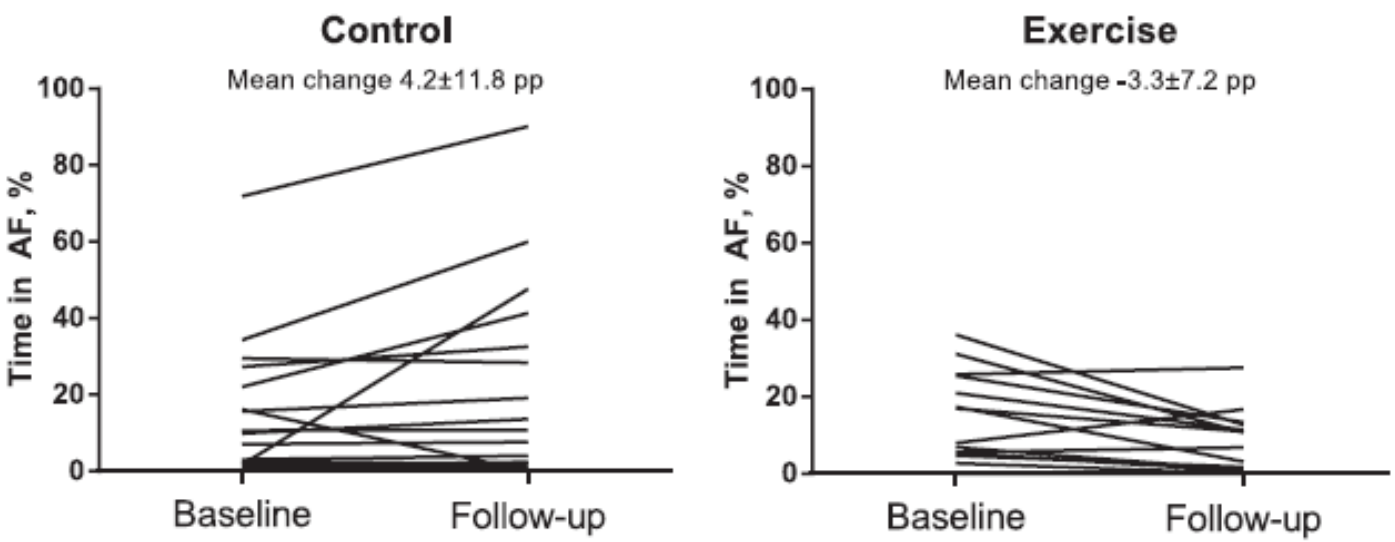
Aerobic Interval Training in Atrial Fibrillation

Arrhythmia/Electrophysiology

Aerobic Interval Training Reduces the Burden of Atrial Fibrillation in the Short Term

A Randomized Trial

Vegard Malmo, MD; Bjarne M. Nes, PhD; Brage H. Amundsen, MD, PhD;
Arnt-Erik Tjonna, PhD; Asbjorn Stoylen, MD, PhD; Ole Rossvoll, MD; Ulrik Wisloff, PhD;
Jan P. Loennechen, MD, PhD



Malmo et al. 2016. Circulation. 133:466-473

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Exercise Training in Patients with Persistent or Permanent AF: An RCT (EXERCISE-AF)

Principal Investigator:
Jennifer Reed, PhD

Co-Investigators:
Andrew Pipe, MD
David Birnie, MD
Robert Reid, PhD
George Wells, PhD
Heather Tulloch, PhD

Purpose: examine the impact of HIIT compared to MICE and standard care in adults with persistent or permanent atrial fibrillation on exercise capacity, quality of life, HR control, muscular fitness and exercise adherence

Recruitment target (n=132)

Standard Care	Moderate-Intensity Continuous Exercise (MICE)	High-Intensity Interval Training (HIIT)
Standard care for patients with permanent or persistent atrial fibrillation	40 min at 60% of PPO Cycle ergometer 2x/ wk for 12 wks	2 x 8-min interval training blocks 30-sec at 100% of PPO; 30-sec at 25% of PPO Cycle ergometer 2x/ wk for 12 wks

Interested in participating, email: mmistura@ottawaheart.ca

Funding Source: CIHR Project Scheme

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CHAMPLAIN-AF

ELSEVIER

CJC Open

Available online 21 January 2022

In Press, Journal Pre-proof

Original Article

The Physical Activity Levels and Sitting Time of Adults Living with Atrial Fibrillation – The CHAMPLAIN-AF Study

Kimberley L. Way AEP, PhD [a, b], David Birnie MD, MBChB [c], Christopher Blanchard PhD [d], George Wells PhD [e], Paul Dorian MD, FRCPC, MSc [f], Harald T. Jorstad MD, PhD [g], Ioana C. Daha MD, PhD [h], Neville Suskin MD MBChB, MSc [i], Paul Oh MD FRCPC, Ratika Parkash MD FRCPC, MSc [d], Paul Poirier MD, PhD [j], Stephanie A. Prince PhD [k, e], Heather Tulloch PhD [l], Andrew L. Pipe CM, MD [a, m], Harleen Hans RKin, MSc [a], Janet Wilson [a, m], Katelyn Comeau [a, n], Sol Vidal-Almela CEP, MSc [a, n, o] … Jennifer L. Reed RKin, PhD [a, e, n]

Way et al. 2020. In progress.

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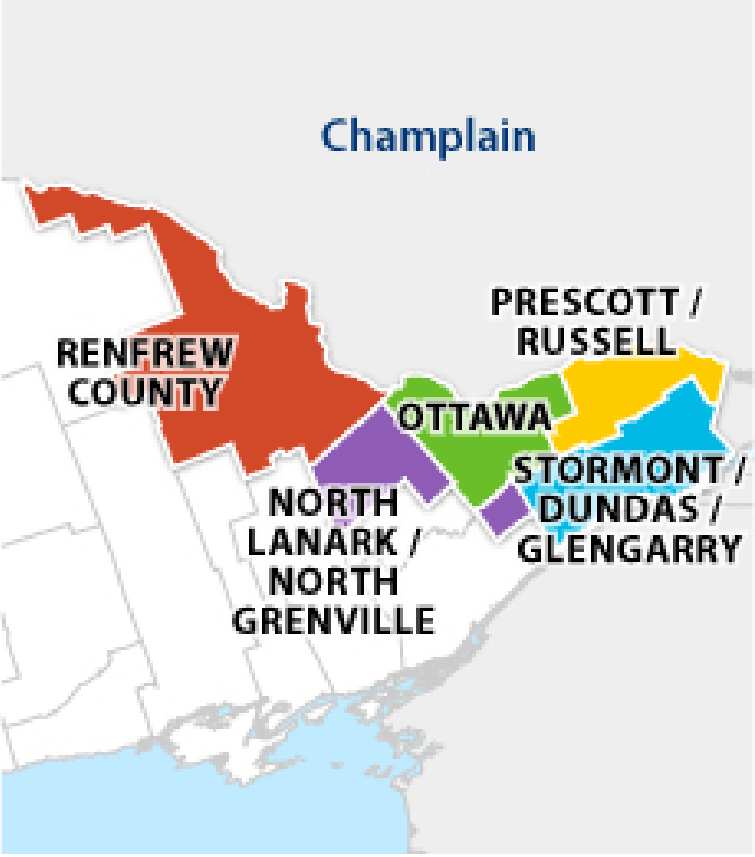
Highlights

N=619

Paroxysmal, persistent & permanent



- **56% were not meeting the Canadian 24H Movement Guidelines**
- **54% did not know/were unsure of the PA recommendations**
- **72% thought physical activity should be part of AF management.**

Way et al. 2020. In progress.

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Sex-Differences in Exercise

Important, understudied area of research

- SAFETY trial: 37% of women and 56% of men with AF reported meeting the Australian PA guidelines (Ball, 2013)

- EORP-AF survey in women with AF: 39% reported not engaging in any PA, 35% in occasional PA (Proietti, 2017)

Some research has shown women achieve smaller improvements in fitness following the same exercise program as men

A focus of our research program

LIVING WITH PERSISTENT ATRIAL FIBRILLATION?

HELP US UNDERSTAND THE TYPICAL EXERCISE RESPONSE IN AF

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JOIN OUR PHYSICAL ACTIVITY PILOT STUDY!

Exercise Physiology and Cardiovascular Health Lab

This is a pilot study examining acute changes in atrial fibrillation (AF) symptoms in females and males with persistent AF (aged 40+) while engaging in a standard week of exercise. You will participate in 2 weeks of exercise and a rest week. The exercise sessions will be conducted free of charge at the University of Ottawa Heart Institute

To learn more, please contact Sol, the study coordinator:
svidalalmela@ottawaheart.ca
613-696-7000 ext. 15944

Email is considered a non-secure form of communication as it may be accessed by unauthorized third parties

Version date: 25/07/2021, File #20210524-01H

Questions?

jreed@ottawaheart.ca

@DrJenniferReed