

Delivering Home-Based Cardiac Rehabilitation to Veterans

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May 10, 2016



Audience Poll Question 1 (please respond)

Which statement best describes your facility?

- Offers traditional (but not home-based) cardiac rehab
- Offers home-based (but not traditional) cardiac rehab
- Offers both traditional and home-based cardiac rehab
- Does not offer or refer Veterans to cardiac rehab
- Refers all eligible Veterans to non-VA (fee basis) cardiac rehab
- None of the above (or don't know)

Audience Poll Question 2 (please respond)

What is your primary role as it relates to cardiac rehab?

- I am a VA provider already delivering home-based CR
- I am a VA provider interested in delivering home-based CR
- I am a VA investigator
- I am a VA healthcare trainee
- I am a VA patient
- None of the above

Home-Based Cardiac Rehabilitation



- **Rationale for cardiac rehabilitation**
- **Evidence for home-based delivery**
- **Example programs**
- **Implementation in VHA**

After a heart attack, stent placement, or bypass surgery, patients feel highly motivated to make lifestyle changes.



This is a huge opportunity to improve health and longevity.

AACVPR/AACF/AHA Performance Measures

Patients Who Should be Referred to Cardiac Rehab:

All patients hospitalized for:

- Acute myocardial infarction
- Chronic stable angina
- Coronary artery bypass grafting
- Percutaneous coronary intervention
- Cardiac valve surgery
- Cardiac transplantation

Class I Recommendation
Level of Evidence A

Thomas et al, Circulation 2007

Thomas et al, Circulation 2010

Drozda et al, Circulation 2011

CMS Physician Quality Reporting System (PQRS) Measure #243 (=National Quality Forum #0643)

“Cardiac Rehab Patient Referral from an Outpatient Setting”

Percentage of patients evaluated in an outpatient setting (who within the previous 12 months have experienced an acute MI, CABG surgery, a PCI, cardiac valve surgery, or cardiac transplantation, or who have chronic stable angina and have not already participated in an early outpatient cardiac rehabilitation/secondary prevention program for the qualifying event/diagnosis) **who were referred to a CR program.**

National Committee for Quality Assurance (NCQA)

Healthcare Effectiveness Data and Information Set (HEDIS)

Efficacy and Safety of Exercise Training in Patients With Chronic Heart Failure

HF-ACTION Randomized Controlled Trial

Christopher M. O'Connor, MD

David J. Whellan, MD, MHS

Kerry L. Lee, PhD

Steven J. Keteyian, PhD

Lawton S. Cooper, MD, MPH

Stephen J. Ellis, PhD

Eric S. Leifer, PhD

William E. Kraus, MD

Dalane W. Kitzman, MD

James A. Blumenthal, PhD

David S. Rendall, PA-C

Nancy Houston Miller, RN, BSN

Jerome L. Fleg, MD

Kevin A. Schulman, MD

Robert S. McKelvie, MD, PhD

Faiez Zannad, MD, PhD

Ileana L. Piña, MD

Context Guidelines recommend that exercise training be considered for medically stable outpatients with heart failure. Previous studies have not had adequate statistical power to measure the effects of exercise training on clinical outcomes.

Objective To test the efficacy and safety of exercise training among patients with heart failure.

Design, Setting, and Patients Multicenter, randomized controlled trial of 2331 medically stable outpatients with heart failure and reduced ejection fraction. Participants in Heart Failure: A Controlled Trial Investigating Outcomes of Exercise Training (HF-ACTION) were randomized from April 2003 through February 2007 at 82 centers within the United States, Canada, and France; median follow-up was 30 months.

Interventions Usual care plus aerobic exercise training, consisting of 36 supervised sessions followed by home-based training, or usual care alone.

36 sessions of supervised exercise training →

11% lower risk of death or hospitalization

HR 0.89 (95% CI, 0.81-0.99; p=0.03) JAMA, 2009

CMS Adds Coverage for Systolic Heart Failure in 2014

CMS Decision Memo for Cardiac Rehabilitation Programs Chronic Heart Failure (CAG-00437N), February 2014

The Centers for Medicare & Medicaid Services (CMS) has determined that the evidence is sufficient to expand coverage for cardiac rehabilitation services under 42 C.F.R. § 410.49(b)(1)(vii) to beneficiaries with stable, chronic heart failure defined as patients with left ventricular ejection fraction of 35% or less and New York Heart Association (NYHA) class II to IV symptoms despite being on optimal heart failure therapy for at least six weeks. Stable patients are defined as patients who have not had recent (≤ 6 weeks) or planned (≤ 6 months) major cardiovascular hospitalizations or procedures.

www.cms.gov/medicare-coverage-database/details/nca-decision-memo.aspx?NCAId=270

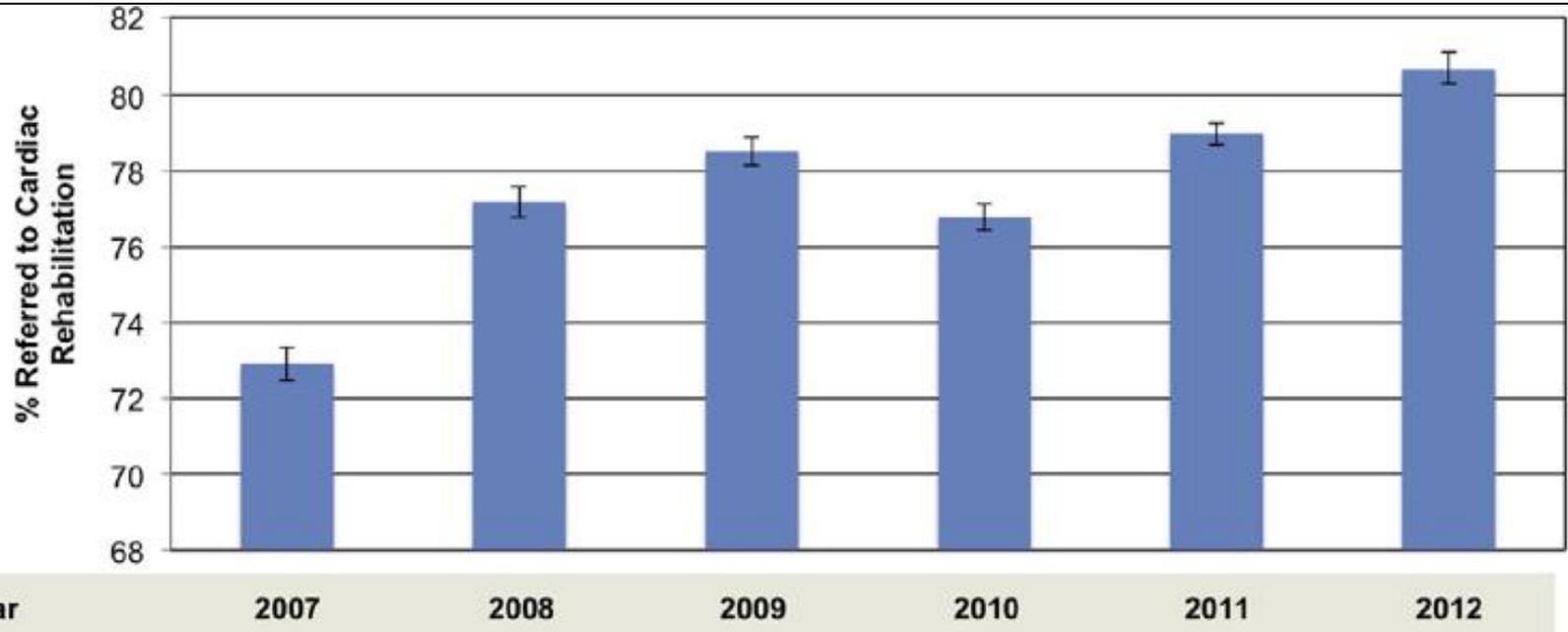
Referral to and Participation in Cardiac Rehab

| Medicare patients hospitalized for CABG or MI | 2000-07 |
|-----------------------------------------------|------------------------------------------------------------------------------|
| Referral to CR | ^a 56% |
| Participation in CR | ^b 19% |
| References | ^a Brown, <i>JACC</i> 2009 ^b Suaya, <i>JACC</i> 2007 |

Trends in Referral to Cardiac Rehabilitation After Myocardial Infarction

Beatty et al,
JACC 2014

Data From the National Cardiovascular Data Registry 2007 to 2012

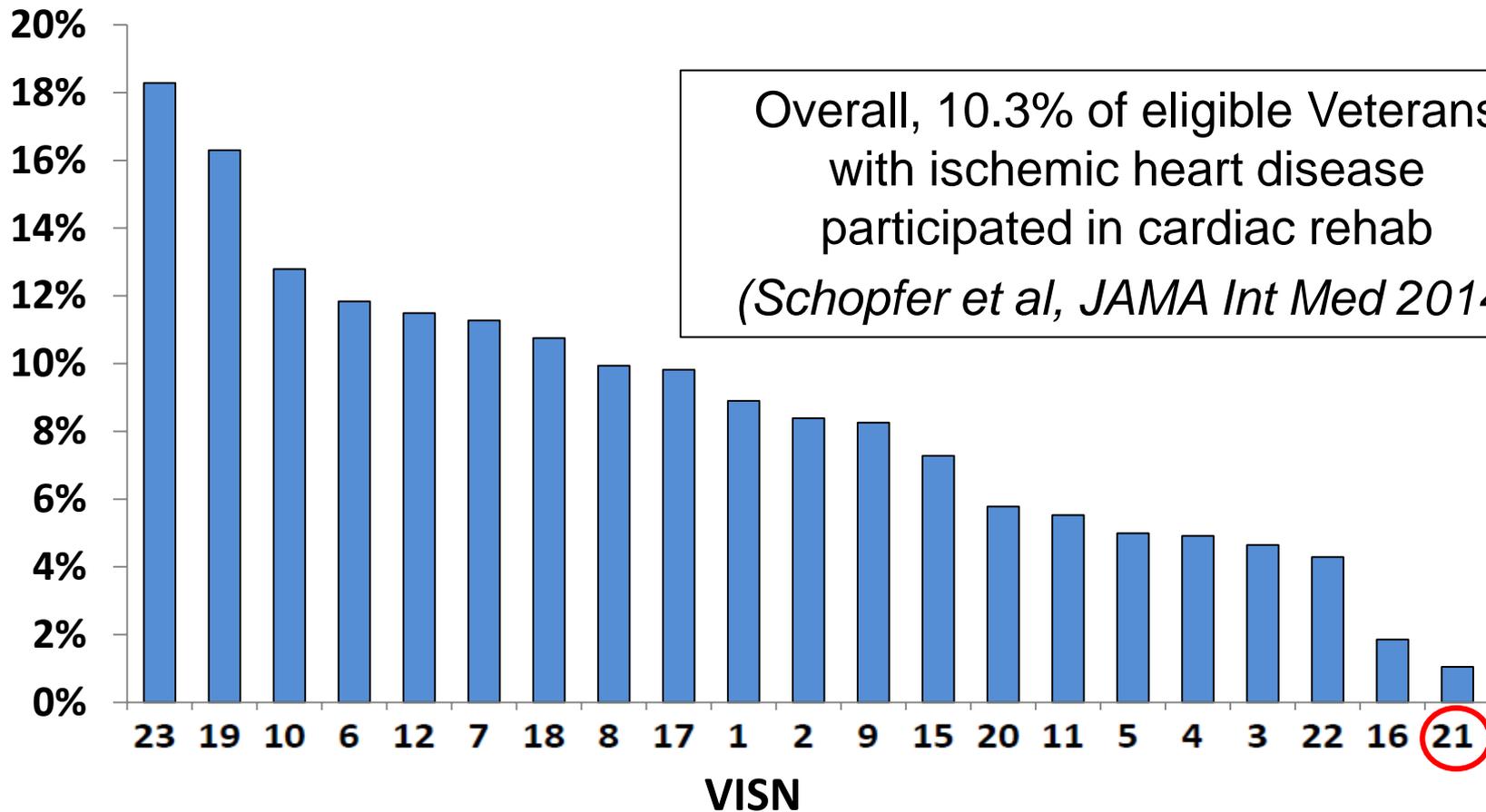


Referral to and Participation in Cardiac Rehab

| Medicare patients hospitalized for CABG or MI | 2000-07 | 2007-12 |
|-----------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Referral to CR | 56% ^a | 73% - 81% ^c |
| Participation in CR | <20% ^b | <20% ^d |
| References | ^a Brown, <i>JACC</i> 2009 ^b Suaya, <i>JACC</i> 2007 | ^c Beatty, <i>JACC</i> 2014 ^d Beatty, <i>Circ QCOR</i> 2015 |

Participation in Cardiac Rehabilitation by VISN (FY07-FY11)

Proportion of Patients Participating in CR



Factors Associated With Utilization of
Cardiac Rehabilitation Among
Patients With Ischemic Heart Disease
in the Veterans Health Administration

A QUALITATIVE STUDY

David W. Schopfer, MD, MAS; Susan Priano, RN, MSN; Kelly Allsup, BS; Christian D. Helfrich, PhD;
P. Michael Ho, MD, PhD; John S. Rumsfeld, MD, PhD; Daniel E. Forman, MD; Mary A. Whooley, MD

Only 35 Cardiac Rehab Centers in VHA



Common Barriers

➤ Patient-level factors:

- Distance from center
- Lack of transportation
- Financial constraints
- Time off from work
- Limited motivation

➤ Provider-level factors

- Awareness of guidelines
- Unsure how to refer

➤ System-level factors:

- Organizational dynamics
- Complexity of programs
- Poor reimbursement

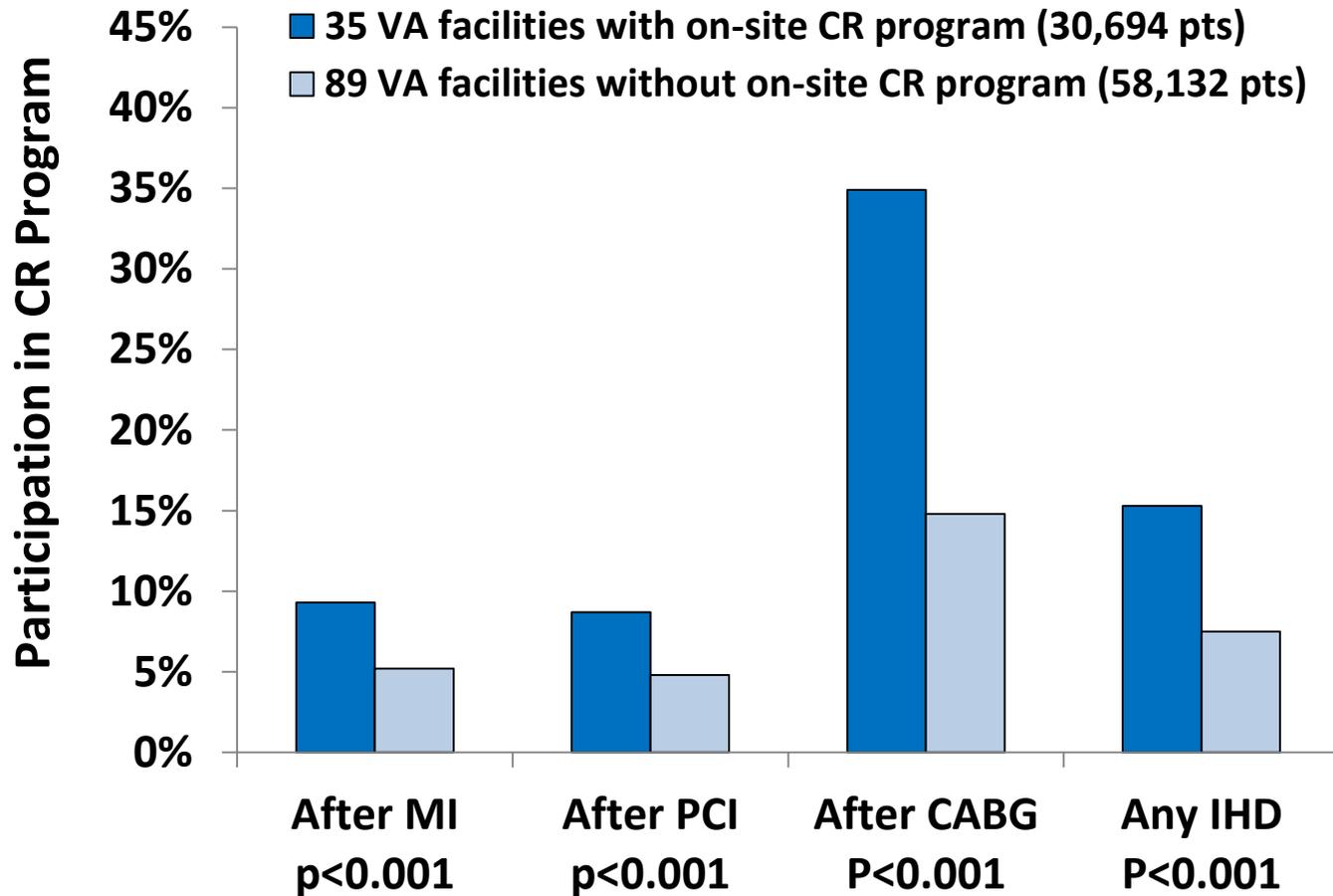
Schopfer D et al, J Cardiovasc Pulm Rehab, 2016 (QUERI RRP 12-232)

Forman D et al, Mayo Clinic Proceedings, In press (QUERI RRP 12-253)

Should We Build New Cardiac Rehab Facilities?



Participation in Cardiac Rehab at 124 VA hospitals (2007-11)



Probably not!

*Schopfer et al,
JAMA Int Med,
2014*



New delivery strategies needed!

Home-Based Cardiac Rehabilitation



- Rationale for cardiac rehabilitation
- **Evidence for home-based delivery**
- Example programs
- Implementation in VHA



Cochrane
Library

Cochrane Database of Systematic Reviews

*Cochrane Database of
Systematic Reviews*

2015, Issue 8

www.cochranelibrary.com

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

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

Home- and center-based forms of cardiac rehabilitation seem to be equally effective for improving clinical and health-related quality of life outcomes. This finding supports the continued expansion of home-based programs.

RCTs of Center-based vs. Home-based Cardiac Rehab

| Outcome (3 to 12 months) | # Studies | Total # Subjects | Risk Ratio | 95% CI |
|-----------------------------|-----------|---------------------|-------------|-------------------|
| Smoking | 6 | 986 | 0.98 | 0.79, 1.21 |
| Mortality | 7 | 1166 | 0.79 | 0.43, 1.47 |
| Completion | 18 | 1984 | 1.04 | 1.01, 1.07 |

RCTs of Center-based vs. Home-based Cardiac Rehab

| Outcome (3 to 12 months) | Units | Total # subjects | Mean difference between groups | 95% CI |
|--------------------------|--------------|------------------|--------------------------------|-------------------|
| Systolic BP | mmHg | 1117 | +0.2 | -3.4, +3.8 |
| Diastolic BP | mmHg | 991 | -1.9 | -3.0, -0.8 |
| Total cholesterol | mg/dL | 1109 | -2.7 | -9.3, +4.3 |
| HDL cholesterol | mg/dL | 883 | -2.7 | -4.3, -1.2 |
| LDL cholesterol | mg/dL | 388 | -2.3 | -10.4, +5.8 |

Greater participation in HBCR can offset lower efficacy

Efficacy X **Participation** = **Effectiveness**

**Facility-
Based:**

+++++

X

++

=

+++

**Home-
Based:**

++

X

+++++

=

+++

Potential Advantages of Home-Based CR

- No wait list/capacity issues
- Customizable and individually tailored
- Flexible scheduling
- No travel/transportation issues
- Greater privacy
- Lower cost
- Integrated with patient's regular home routine
- Possibly greater adherence and sustainability

Potential Disadvantages of Home-Based CR

- Lack of reimbursement
- Less intensive exercise training
- Lower social support
- Less patient accountability
- Lack of standardization among programs
- Minimal patient monitoring
- Safety concerns for sicker patients

The Safety of Cardiopulmonary Exercise Testing in a Population With High-Risk Cardiovascular Diseases

Joseph Skalski, MD; Thomas G. Allison, PhD, MPH; Todd D. Miller, MD, FAHA

5060 exercise studies in 4250 high risk patients, including:

- N= 1289 Congestive Heart Failure
- N= 598 Hypertrophic Cardiomyopathy
- N= 194 Pulmonary Hypertension
- N= 212 Aortic Stenosis
- N= 686 Age 75 or Older
- N= 1748 Women
- N= 1192 Peak $\dot{V}O_2 < 14$ ml/kg/min

**Adverse
events in
1/625 studies
(no deaths)**

Exercise Training and Implantable Cardioverter-Defibrillator Shocks in Patients With Heart Failure

Results From HF-ACTION (Heart Failure and A Controlled Trial Investigating Outcomes of Exercise TraiNing)

Jonathan P. Piccini, MD, MHS,* Anne S. Hellkamp, MS,* David J. Whellan, MD,†
Stephen J. Ellis, PhD,* Steven J. Keteyian, PhD,‡ William E. Kraus, MD,*
Adrian F. Hernandez, MD, MHS,* James P. Daubert, MD,* Ileana L. Piña, MD, MPH,§
Christopher M. O'Connor, MD,* for the HF-ACTION Investigators

Durham, North Carolina; Philadelphia, Pennsylvania; Detroit, Michigan; and Cleveland, Ohio

- **RCT of 1053 patients with HF + reduced LVEF + defibrillator**
- **Exercise training (n=546) vs. usual care (n=507)**
- **No difference in # defibrillator shocks between groups**

Home-Based Cardiac Rehabilitation



- Rationale for cardiac rehabilitation
- Evidence for home-based delivery
- **Example programs**
- Implementation in VHA

The Heart Manual



1992-present

©The Heart Manual, NHS Lothian

European Journal of Cardiovascular Nursing 10 (2011) 3 – 13

A systematic review of the Heart Manual literature

Michelle Clark ^{a,*}, Tony Kelly ^b, and Carolyn Deighan ^c

^a *Heart Manual Department Astley Ainslie Hospital, NHS Lothian Edinburgh EH9 2HL Scotland, UK*

^b *Community Treatment Centre for Brain Injury, NHS Greater Glasgow 70 Commercial Road Gorbals, Glasgow G5 0QZ*

^c *Heart Manual Department Astley Ainslie Hospital, NHS Lothian Edinburgh EH9 2HL Scotland, UK*

Conclusion: Evidence from RCTs suggests the Heart Manual is as effective as hospital-based cardiovascular rehabilitation on psychological, behavioral, and biological outcomes.

>20 Years Ago . . .

1 May 1994

Volume 120

Annals of Internal Medicine

A Case-Management System for Coronary Risk Factor Modification after Acute Myocardial Infarction

Robert F. DeBusk, MD; Nancy Houston Miller, RN; H. Robert Superko, MD; Charles A. Dennis, MD; Randal J. Thomas, MD, MS; Henry T. Lew, MD; Walter E. Berger III, MD; Robert S. Heller, MD; Jonathan Rompf, MD; David Gee, MD; Helena C. Kraemer, PhD; Albert Bandura, PhD; Ghassan Ghandour, PhD; Mia Clark, RD, MPH; Raksha V. Shah, RD, MS; Lynda Fisher; and C. Barr Taylor, MD

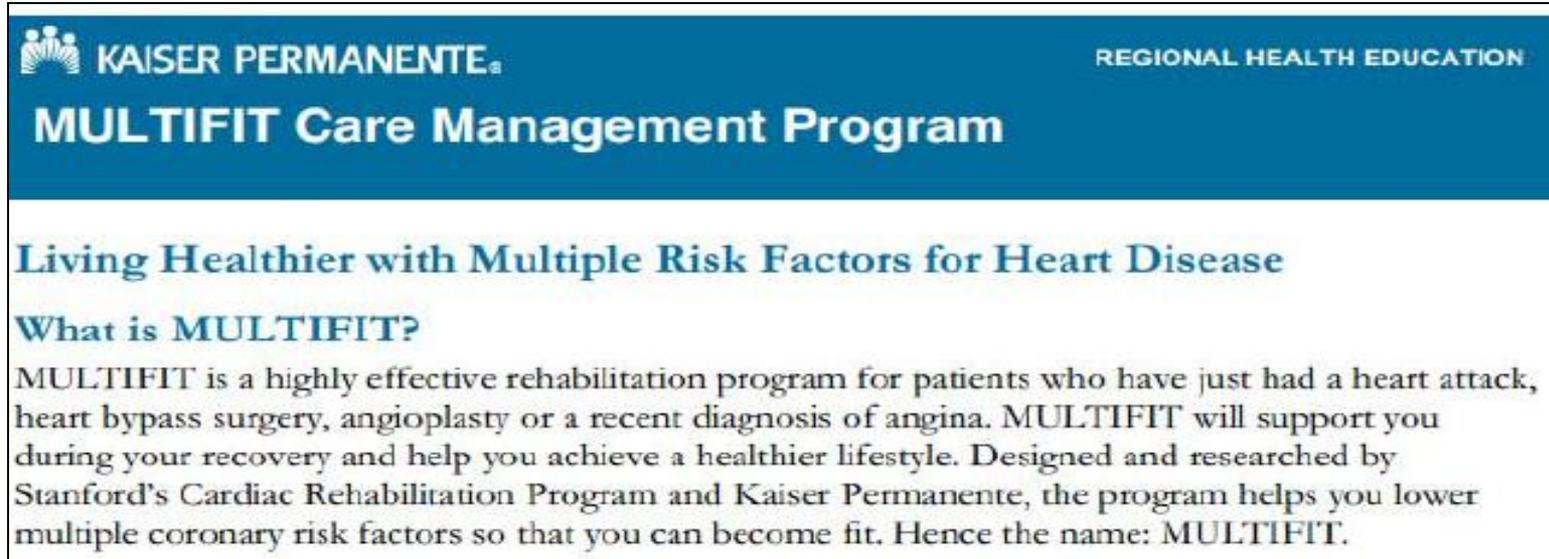
- RCT of 585 patients at 5 Kaiser Medical Centers
- Home-Based Cardiac Rehabilitation vs. Usual Care

MULTIFIT TRIAL RESULTS (*DeBusk, 1994*)

| | Home-based cardiac rehab (n=293) | Usual care (n=292) | P value |
|--------------------------|----------------------------------|--------------------|---------|
| Smoking cessation | 70% | 53% | 0.03 |
| LDL (mg/dL) | 107 | 132 | 0.001 |
| Exercise capacity (METS) | 9.3 | 8.4 | 0.001 |

Today. . .

Kaiser Permanente MULTIFIT Program



The slide features a dark blue header with the Kaiser Permanente logo on the left and the text 'REGIONAL HEALTH EDUCATION' on the right. Below the header, the title 'MULTIFIT Care Management Program' is displayed in white. The main content area has a white background with a dark blue title 'Living Healthier with Multiple Risk Factors for Heart Disease'. Below this, the section 'What is MULTIFIT?' is followed by a paragraph describing the program as a rehabilitation program for heart attack patients, designed by Stanford's Cardiac Rehabilitation Program and Kaiser Permanente.

KAISER PERMANENTE REGIONAL HEALTH EDUCATION

MULTIFIT Care Management Program

Living Healthier with Multiple Risk Factors for Heart Disease

What is MULTIFIT?

MULTIFIT is a highly effective rehabilitation program for patients who have just had a heart attack, heart bypass surgery, angioplasty or a recent diagnosis of angina. MULTIFIT will support you during your recovery and help you achieve a healthier lifestyle. Designed and researched by Stanford's Cardiac Rehabilitation Program and Kaiser Permanente, the program helps you lower multiple coronary risk factors so that you can become fit. Hence the name: MULTIFIT.

http://mydoctor.kaiserpermanente.org/ncal/Images/1029-E%20Revised%2010-10_tcm75-14569.pdf

<http://abc30.com/health/patients-get-heart-smart-with-multifit-program/511230/>

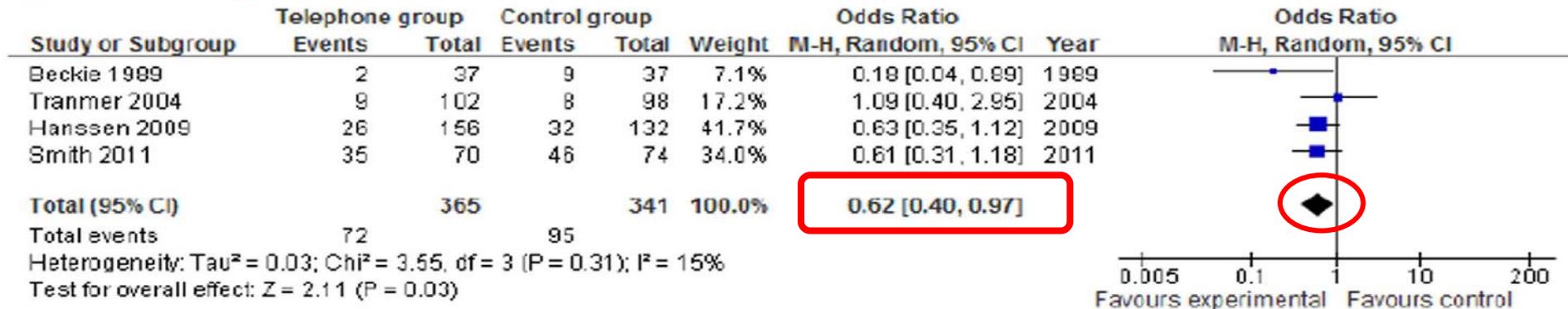
The Effect of Telephone Support Interventions on Coronary Artery Disease (CAD) Patient Outcomes during Cardiac Rehabilitation: A Systematic Review and Meta-Analysis

PLOS ONE, 2014

Ahmed Kotb^{1,2*}, Shuching Hsieh², George A. Wells^{1,2}

¹ Department of Epidemiology and Community Medicine, University of Ottawa, Ottawa, Canada, ² Cardiovascular Research Methods Centre, University of Ottawa Heart Institute, Ottawa, Canada

B) All-cause hospitalization



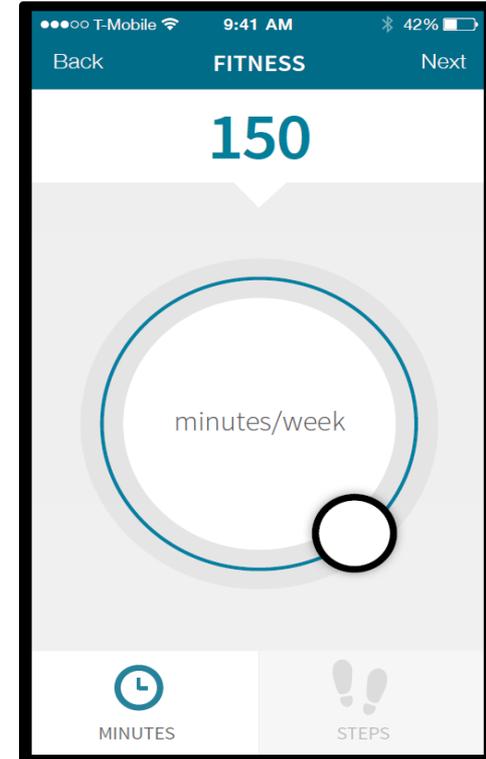
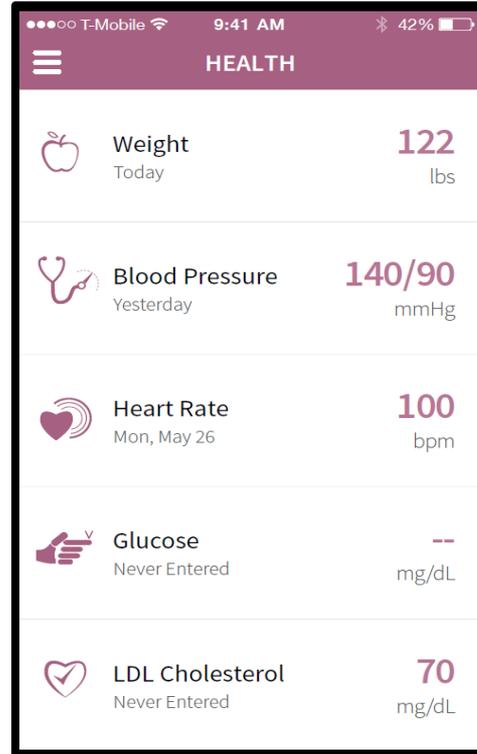
Telephone CR interventions → 38% reduction in re-hospitalization

Smartphone-based home care model improved use of cardiac rehabilitation in postmyocardial infarction patients: results from a randomised controlled trial

Marlien Varnfield,^{1,2} Mohanraj Karunanithi,^{1,3} Chi-Keung Lee,⁴ Enone Honeyman,¹ Desre Arnold,⁴ Hang Ding,¹ Catherine Smith,² Darren L Walters^{3,5}

- RCT of 120 post-MI patients
- Smartphone-based home CR (vs. center-based CR)
- Greater uptake, adherence, and completion of CR
- Similar improvements in exercise capacity

VA Mobile Application in Development



Alexis Beatty MD MAS

Home-Based Cardiac Rehabilitation



- Rationale for cardiac rehabilitation
- Evidence for home-based programs
- Examples from other health systems
- **Implementation in VHA**

San Francisco VA Health Care System



Healthy Heart Program



A to Z List of Services

Caregivers

Homeless Veterans

Returning Service Members

Women Veterans

Take control of your life.

Begin your journey to a healthier heart!

Introduction

Cardiovascular disease affects more than 1 in 3 American adults and is the leading cause of death in the United States. The Healthy Heart Program is a free, 12-week, home-based, customized exercise and lifestyle program that is intended to help Veterans achieve and maintain optimal cardiovascular health.

CONTACT INFO

Location

Building 203, 1st
Floor, Room 1A-13A

Contact Number(s)

415-750-2016

Hours of

Operation

Monday - Friday
8 a.m. - 4:30 p.m.

<http://www.sanfrancisco.va.gov/services/HealthyHeart .asp>

Key Facilitators for Implementation

- Stakeholder engagement
 - CT surgery
 - Cardiology
 - Physical therapy/rehabilitation
 - Nutrition
 - Clinical Applications Coordinator
- Systematic (automated) referral
- Bedside visit during hospitalization for index event
- Multidisciplinary team (nurse, exercise physiologist, dietician, psychologist, physician)
- Tracking of patients

Arena et al, Circulation 2012

Canadian Journal of Cardiology 27 (2011) 192–199

Society Position Statement

Systematizing Inpatient Referral to Cardiac Rehabilitation 2010: Canadian Association of Cardiac Rehabilitation and Canadian Cardiovascular Society Joint Position Paper

Endorsed by the Cardiac Care Network of Ontario

Sherry L. Grace, PhD (Chair),^a Caroline Chessex, MD, FRCPC (Co-Chair),^b

Heather Arthur, PhD,^c Sammy Chan, MD,^d Cleo Cyr, RN, BN, MHS,^e William Dafoe, MD,^f

Martin Juneau, MD,^g Paul Oh, MD,^h and Neville Suskin, MBChBⁱ

Post-PCI Order Set

Cardiology Post-Cath Add Order Submenu

- Patient Movement Orders
- Diagnosis
- Post-procedure Vitals routine
- Check Cath Site(s):
- Method of Closure:
- Check cath sites for
- Post-cath I&Os
- Activity:
- Activity:
- POST CARDIAC CATH HEART HEALTHY DIET
- Resume previous meds
- Call HO/Fellow if
- CARDIAC REHAB



AHA Science Advisory

Increasing Referral and Participation Rates to Outpatient Cardiac Rehabilitation: The Valuable Role of Healthcare Professionals in the Inpatient and Home Health Settings

A Science Advisory From the American Heart Association

Endorsed by the Preventive Cardiovascular Nurses Association and the American Association of Cardiovascular and Pulmonary Rehabilitation

Ross Arena, PhD, PT, FAHA, Chair; Mark Williams, PhD; Daniel E. Forman, MD; Lawrence P. Cahalin, PhD, PT, CCS; Lola Coke, PhD, RN, FAHA; Jonathan Myers, PhD, FAHA; Larry Hamm, PhD; Penny Kris-Etherton, PhD, RD, FAHA; Reed Humphrey, PhD, PT; Vera Bittner, MD; Carl J. Lavie, MD; on behalf of the American Heart Association Exercise, Cardiac Rehabilitation and Prevention Committee of the Council on Clinical Cardiology, Council on Epidemiology and Prevention, and Council on Nutrition, Physical Activity and Metabolism

(Circulation. 2012;125:1321-1329.)

© 2012 American Heart Association, Inc.

Phases of Cardiac Rehabilitation

| | | |
|----------------|-----------------------------------------|-----------------------------------------|
| Phase 1 | Assessment and education | In hospital |
| Phase 2 | Individualized exercise training | 0 to 12 weeks post-discharge |
| Phase 3 | Long-term maintenance | >12 weeks post-discharge |

Healthy Heart Program

| | | | | | | | | | | | | | | | |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------|---|---|--------------------|---|---|----------------------|----|----|----|----|----|----|
| Month: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | |
| Bedside visit by CR nurse before discharge | 6 weekly sessions | | 3 biweekly sessions | | | 3 monthly sessions | | | 3 bimonthly sessions | | | | | | |
| | → | | | | | | | | | | | | | | |
| Session: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | <p style="text-align: center;">At each session:</p> <ol style="list-style-type: none"> 1. Assess symptoms 2. Reconcile medications 3. Review logs (physical activity, BP, HR, weight, diet, mood) 4. Provide education (exercise, nutrition, CV risk factors) 5. Motivational interviewing → set goal(s) for the next week | | | | | | | | | | | | | | |

American Heart Association (AHA), January 2013

“An Active Partnership For the Health of Your Heart”



Hand Weights



Pedometer



TheraBands



Exercise Peddler

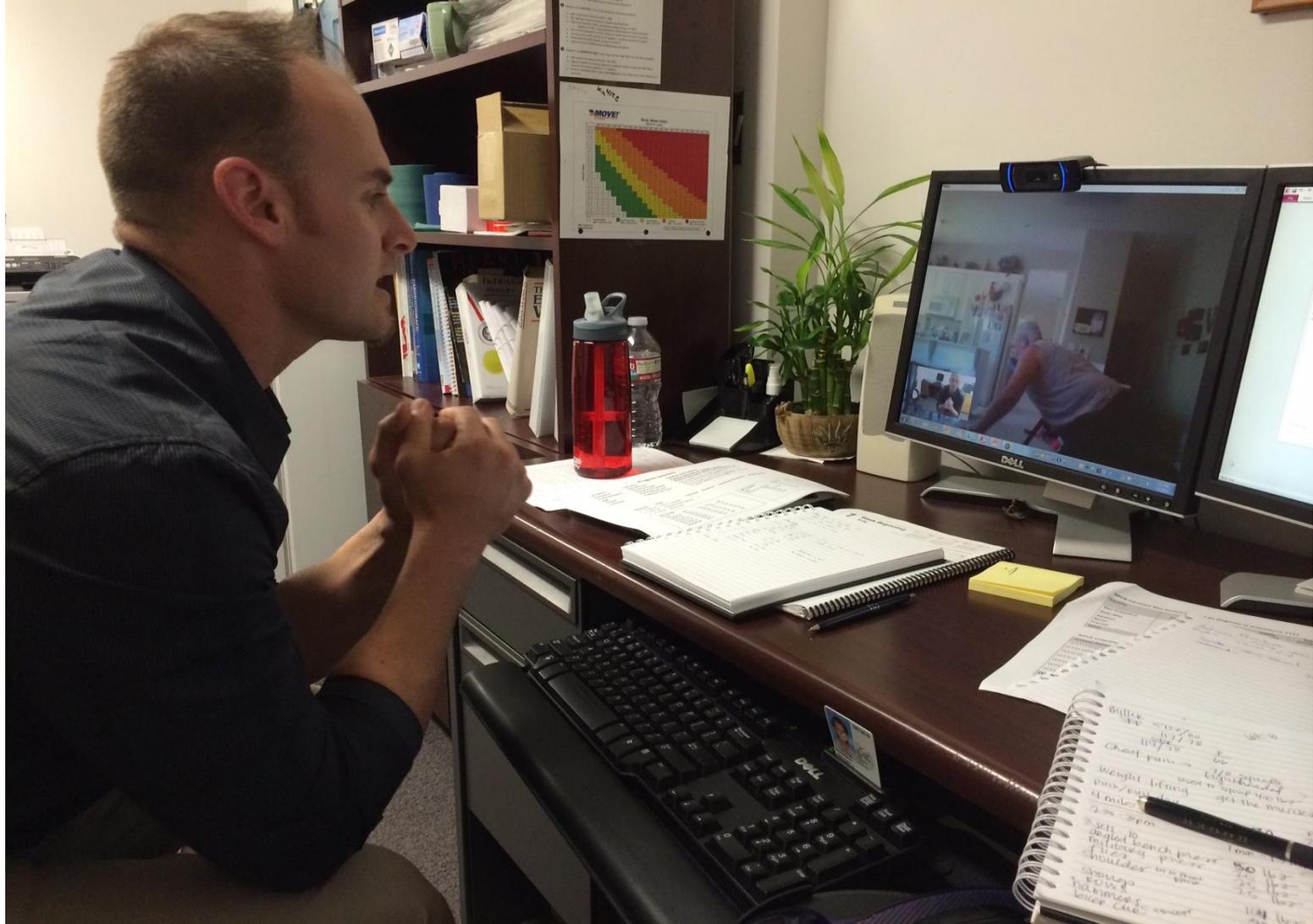


Heart Rate Watch



Home exercise equipment (if necessary)





FTEE (per ~300 eligible patients/150 enrolled in HBCR)

1.5 Cardiac rehabilitation nurses

0.2 Dietician

0.8 Exercise physiologist

0.2 Physician director

0.1 Psychologist

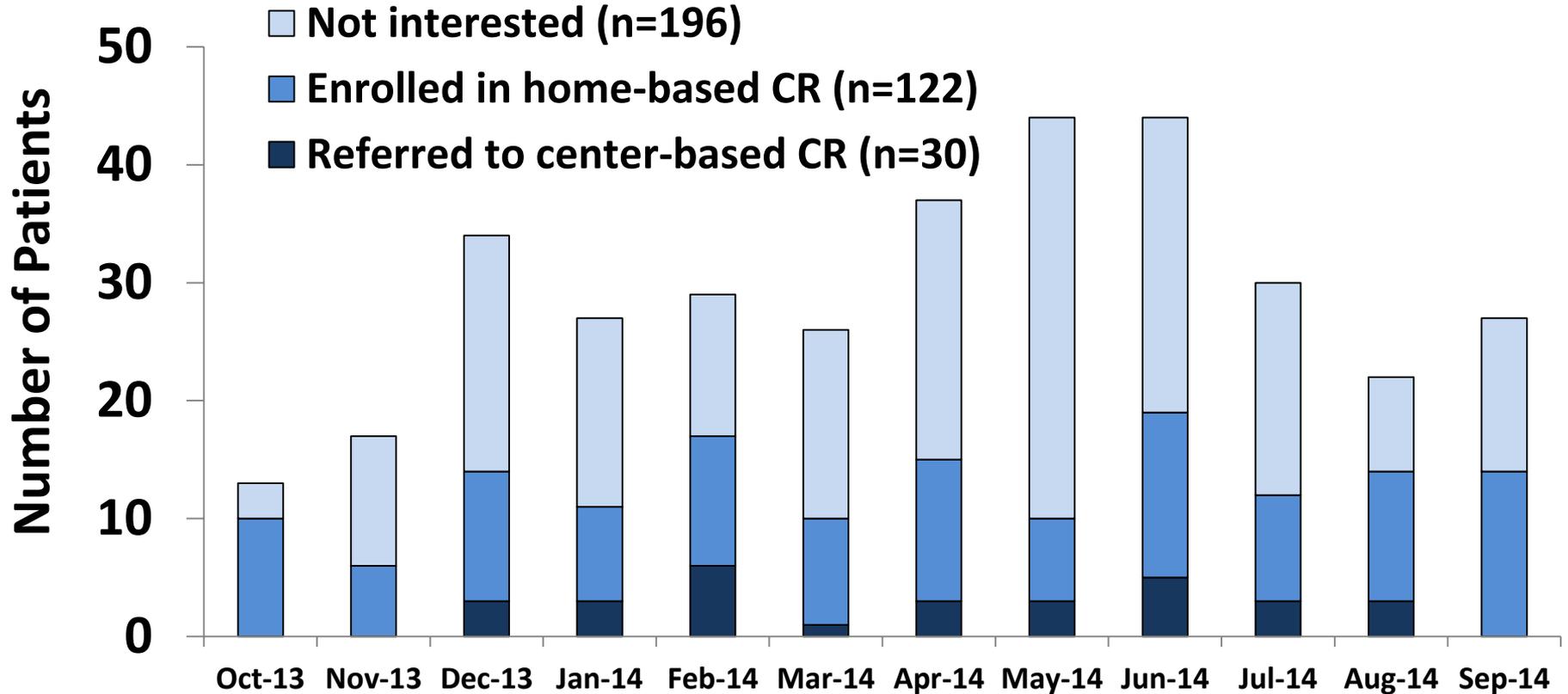
0.2 Program manager

3.0 Total FTEE (per 300 Phase I and 150 Phase II)

Goal:

Cost-neutral or cost-saving (by reducing hospitalizations)

Office of Rural Health Funding: 350 Patients Referred to Healthy Heart Program in the First Year (FY14)



Office of Rural Health (ORH) Home-Based Cardiac Rehab Programs

Contact:

Kariann.drwal@va.gov

Bonnie.wakefield@va.gov

Iowa City VA

Components of Home-Based CR Program (Summary)

- Automatic referrals (post-CABG, post-PCI order sets)
- Bedside visit by cardiac rehabilitation nurse
- Exercise prescription and physical activity monitoring
- Motivational interviewing and goal setting
- Provision of home exercise equipment (if needed)
- Medication reconciliation and tracking
- Nutrition and weight management
- Stress reduction (including peer support group calls)
- Risk factor management (blood pressure, lipids, smoking)

Home-Based Cardiac Rehabilitation



- **Rationale for cardiac rehabilitation**
- **Evidence for home-based delivery**
- **Example programs**
- **Implementation in VHA**

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