

Cardiac Rehabilitation 101: Needs and Opportunities to Address Disparities

October 20, 2020

11:00am-12:00pm ET/8:00-9:00am PT



Meeting Logistics

- You should be automatically muted, but please confirm
- Webinar is being recorded
- Please save questions for the Q&A period at the end of the presentations
 - To ask a question, raise your hand and you will be unmuted
 - Alternatively, submit your question via the chat box and we will get to it



Overview

- Million Hearts[®] 2022 and Cardiac Rehabilitation
 - Laurence Sperling, MD, FACC, FACP, FAHA, FASPC
- What is Cardiac Rehabilitation?
 - Dean Diersing, MS, MS, RCEP, EP-C, EIM3, CCRP, FAACVPR, University Medical Center
- Latest Cardiac Rehabilitation Evidence/Research
 - Randal Thomas, MD, MS, MAACVPR, FAHA, Mayo Clinic
- Social Determinants of Health/Disparities in Cardiac Rehabilitation
 - Simone Bailey-Brown, MD, Rochester Regional Health Systems
- Q&A



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Million Hearts[®] 2022 and Cardiac Rehabilitation

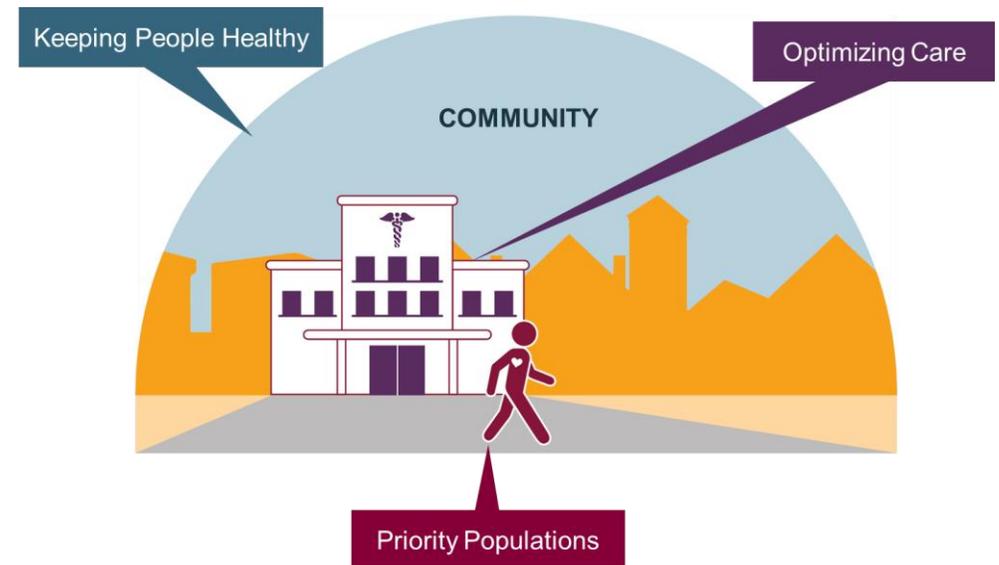
Laurence Sperling, MD, FACC, FACP, FAHA, FASPC
Executive Director, Million Hearts[®]

Division for Heart Disease and Stroke Prevention, CDC
Center for Clinical Standards and Quality, CMS
Katz Professor in Preventive Cardiology
Professor of Global Health
Emory University



Million Hearts[®] 2022

- **Aim:** Prevent 1 million—or more—heart attacks and strokes in the next 5 years
- National initiative co-led by:
 - Centers for Disease Control and Prevention (CDC)
 - Centers for Medicare & Medicaid Services (CMS)
- Partners across federal and state agencies and private organizations



Million Hearts[®] 2022

Keeping People Healthy

Reduce Sodium Intake

Decrease Tobacco Use

Decrease Physical Inactivity

Optimizing Care

Improve ABCS*

Increase Use of Cardiac Rehabilitation

Engage Patients in Heart-healthy Behaviors

70%

Improving Outcomes for Priority Populations

Blacks/African Americans with hypertension

35- to 64-year-olds

People who have had a heart attack or stroke

People with mental illness or substance use disorders who use tobacco



*Aspirin when appropriate, Blood pressure control, Cholesterol management, Smoking cessation

Cardiac Rehabilitation: 101

Dean Diersing, MS, ACSM-CEP, EP, CCRP, FAACVPR

Assistant Director of PM&R
University Medical Center –
Lubbock, Texas

President

American Association of Cardiovascular and Pulmonary Rehabilitation
(AACVPR)



Objectives

- Understand the program components of Cardiac Rehab (CR)
- Outline the daily regulatory application of CR operations
- Describe the AACVPR support of program and professional certifications and the formation of a registry

What is CR?

- Cardiac rehabilitation (CR) is a medically supervised, comprehensive secondary prevention program used to improve cardiovascular health and prevent subsequent cardiovascular events.
- Following a baseline patient assessment, an optimal CR experience consists of:
 - 36 one-hour sessions that include nutritional counseling and lifestyle education to manage cardiovascular risk factors (lipids, blood pressure, weight, diabetes mellitus, and smoking), psychosocial interventions, and physical activity with supervised exercise training.
- These services are provided one-on-one or in a group setting by a multi-disciplinary team of professionals.

CR as defined in the Federal Register

- Cardiac rehabilitation (CR) services mean a physician-supervised program that furnishes:
 - physician prescribed exercise,
 - cardiac risk factor modification, including education, counseling, and behavioral intervention;
 - psychosocial assessment,
 - outcomes assessment

42 CFR 410.49(c). Effective January 1, 2010

MCR Beneficiary Requirements

- Medicare covers CR/ICR program services for beneficiaries who have experienced one or more of the following:
 - Acute myocardial infarction within the preceding 12 months
 - Coronary artery bypass surgery
 - Current stable angina pectoris
 - Heart valve repair or replacement
 - Percutaneous transluminal coronary angioplasty (PTCA) or coronary stenting
 - Heart or heart-lung transplant
 - CHF (EF \leq 35%; NYHA Class II-IV)

Phases of CR

Phase I

- Inpatient
- 1 day to LOS
- Focus on ADLs, strengthening, Ambulation & early education
- Encouragement for Phase II

Phase II

- Outpatient
- Medically supervised
- Up to 36 sessions
- Exercise Training, Secondary prevention
- Multidisciplinary
- Medicare approved

Phase III

Phase IV

III – independent, medically supervised, exercise in a CR facility (period of time up to lifetime)

IV – Independent exercise in the community (lifetime)

CR Programs must include the following components:

- 1) physician-prescribed exercise each day CR services are furnished
- 2) cardiac risk factor modification
- 3) psychosocial assessment
- 4) outcomes assessment
- 5) an individualized treatment plan detailing how components are utilized for each patient. The individualized treatment plan must be established, reviewed and signed by a physician every 30 days.

42 CFR 410.49(c). Effective January 1, 2010

Referral & ITP workflow

Physician order to CR: Inpatient or Outpatient



CR Team performs evaluation and drafts initial ITP



ITP Review and Physician Signature



CR Team Drafts 30 Day ITP



ITP Review and Physician Signature

Individualized Treatment Plan (ITP)

- A written plan tailored to each individual patient:
 - Diagnosis
 - Type, Amount, Frequency, Duration of Services
 - Individualized goals (exercise & non-exercise)
 - Physician Signature

CR Sessions

CR sessions are limited to a maximum of 2 1-hour sessions per day up to 36 sessions furnished over a period of up to 36 weeks, with the option for an additional 36 sessions at Medicare contractor discretion over an extended period of time.



Staff of CR

- Physician Medical Director
- Registered Nurse
- Clinical Exercise Physiologist
- Dietitians
- Respiratory Therapist
- Physical Therapists
- Behavioral Health Experts
- Etc.

Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update

A Scientific Statement From the American Heart Association Exercise, Cardiac Rehabilitation, and Prevention Committee, the Council on Clinical Cardiology; the Councils on Cardiovascular Nursing, Epidemiology and Prevention, and Nutrition, Physical Activity, and Metabolism; and the American Association of Cardiovascular and Pulmonary Rehabilitation

Gary J. Balady, Mark A. Williams, Philip A. Ades, Vera Bittner, Patricia Comoss, JoAnne M. Foody, Barry Franklin, Bonnie Sanderson, and Douglas Southard

Originally published 18 May 2007 | <https://doi.org/10.1161/CIRCULATIONAHA.106.180945> | Circulation. 2007;115:2675–2682

“The American Heart Association and the American Association of Cardiovascular and Pulmonary Rehabilitation recognize that all cardiac rehabilitation/secondary prevention programs should contain specific core components that aim to optimize cardiovascular risk reduction, foster healthy behaviors and compliance to these behaviors, reduce disability, and promote an active lifestyle for patients with cardiovascular disease.”

AHA/AACVPR Components of CR/Secondary Prevention

Core Components:

- Patient Assessment
- Risk Factor Modification
 - Blood pressure management
 - Lipid management
 - Diabetes management
- Lifestyle Intervention
 - Nutritional Counseling
 - Weight Management
 - Tobacco Cessation
 - Physical activity counseling
- Psychosocial Management
- Exercise Training

Each component consists of:

- Evaluation
- Intervention
- Expected Outcomes

Balady, et al. *Circulation* 2007;115:2675-2682.

AACVPR - Certification

- **AACVPR Program Certification** is the only peer-reviewed accreditation process designed to review individual facilities for adherence to standards and guidelines developed and published by the AACVPR and other professional societies.
 - 1,218 Certified Cardiac Rehab Programs
- The **Certified Cardiac Rehabilitation Professional** (CCRP), exclusively for cardiac rehabilitation (CR) professionals, is the only certification aligned with the published CR competencies.
 - 986 Certified Cardiac Rehabilitation Professionals



AACVPR – Registry

- 576 Cardiac Rehab Registry Subscribers
 - 600,727+ Cardiac Patient Records
 - 94% retention
- Data Analytic Center – UAB



AACVPR
Outpatient
Cardiac
Rehabilitation
Registry

Introducing....

NEW AACVPR Website (www.aacvpr.org),

News&Views and AACVPR Central

Launched Tuesday, October 6





Cardiac Rehabilitation

Benefits, gaps, and potential solutions

Randal J. Thomas, MD, MS, FAHA, FACC, MAACVPR
Professor of Medicine, Mayo Clinic Alix School of Medicine
Medical Director, Cardiac Rehabilitation
Mayo Clinic, Rochester, Minnesota



Disclosures and Conflicts of Interest

- No personal disclosures or conflicts of interest

Objectives

- Identify and apply 3 points about cardiac rehabilitation
 - Evidence of benefits
 - Participation gap
 - New delivery models needed

Secondary CVD Prevention Efficacious Therapies

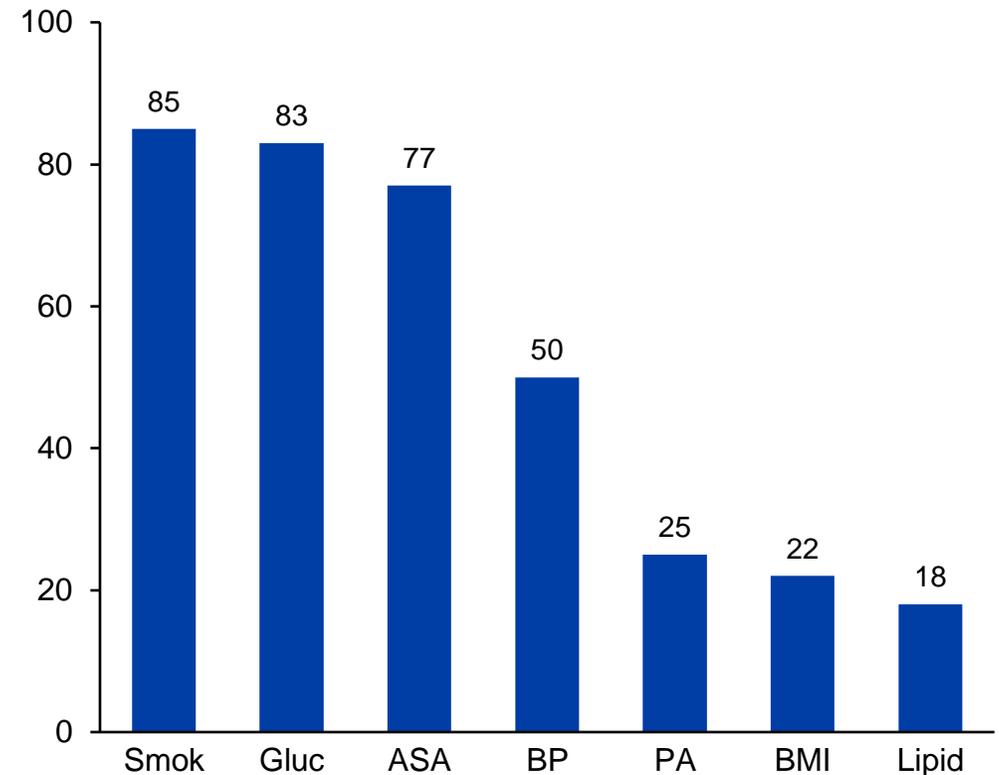
Lifestyle therapies

- Physical activity
- Healthy nutrition
- Smoke-free living

Medication therapies

- Lipid-lowering agents
- Blood pressure-lowering agents
- Antiplatelet agents
- Diabetes agents
- Influenza vaccination

Psychosocial/other health determinants

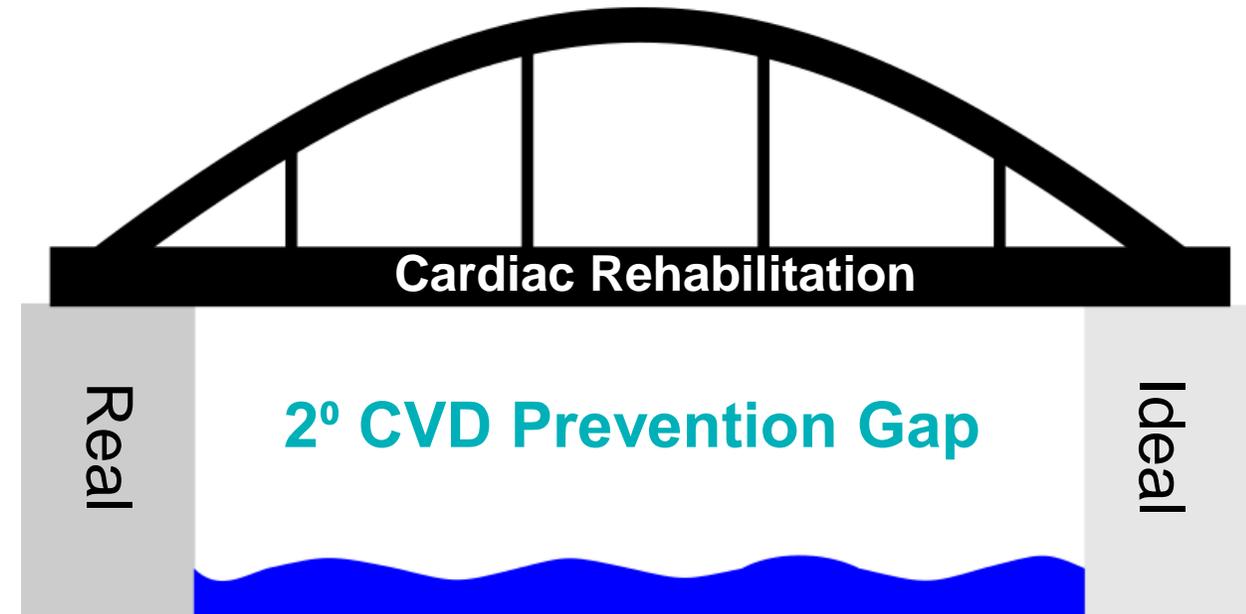


REGARDS Study

Cardiac Rehabilitation Bridging the Prevention Gap

Secondary Prevention Gap

- Lifestyle change
- Preventive medications
- CVD risk factor control
- Psychological health
- Care coordination



Cardiac Rehabilitation is a High Value Service

$$\text{Value} = \frac{\text{Quality (Outcomes, Safety)}}{\text{Cost}}$$

Cardiac Rehabilitation

Improved Outcomes

- **Improvements**
 - **Total mortality: Meta-analyses, 20-30% reduction**
 - **CVD events: Fatal, non-fatal**
 - **Re-hospitalization: Hospitalization and costs**
 - **Risk factor control**
 - **Quality of life**
 - **Functional status**
- **Recent studies similar to older ones**
- **Observational studies suggest even greater impact**

Dalal, et al. *BMJ* 2015; 351 doi: <https://doi.org/10.1136/bmj.h5000>

Taylor, et al. *Am J Med.* 2004 May 15;116(10):682-92

Clark, et al. *Ann Intern Med.* 2005 Nov 1;143(9):659-72

Goel, et al. *Circulation.* 2011;123:2344-52

JACC 2009;54:25-33

Cardiac Rehabilitation Safety

	Cardiac Arrest	Myocardial Infarction	Death
Haskell (30 centers, 1978)*	1 per 32,593 patient hours	1 per 232,809 patient hours	1 per 116,402 patient hours
Van Camp (167 centers, 1986)**	1 per 111,996 patient hours	1 per 293,990 patient hours	1 per 783,972 patient hours
Pavy (65 centers, 2006)***	1 per 1.3 million patient hours	None	None

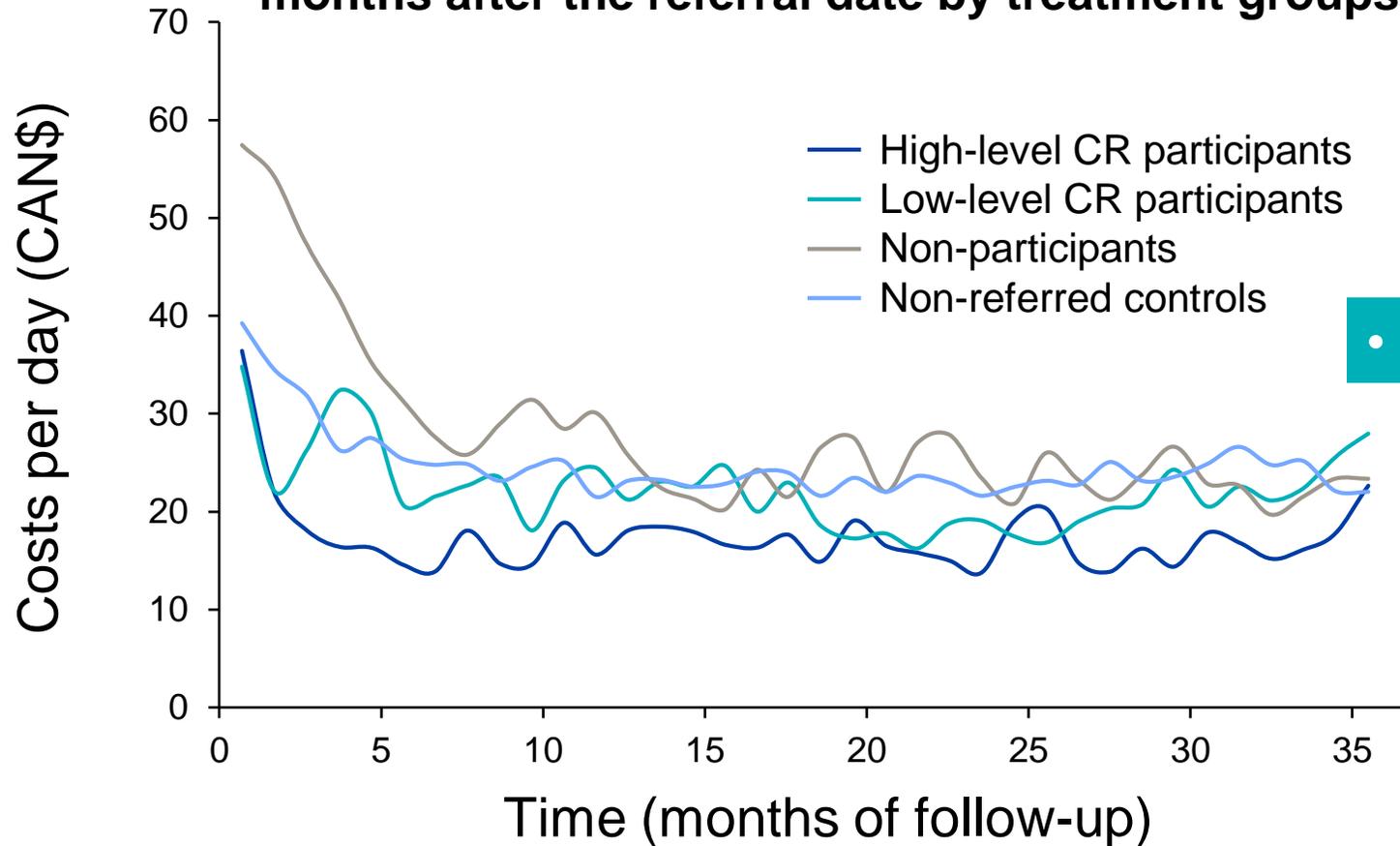
*Haskell WL. Circulation 1978;57:920-924

**Van Camp SP, Peterson RA. JAMA 1986;256:1160-1163

***Pavy, et al. Archives Intern Med 2006. 166:2329-2334

Cardiac Rehabilitation Cost Savings

Health service utilization costs per day in the 36 months after the referral date by treatment groups



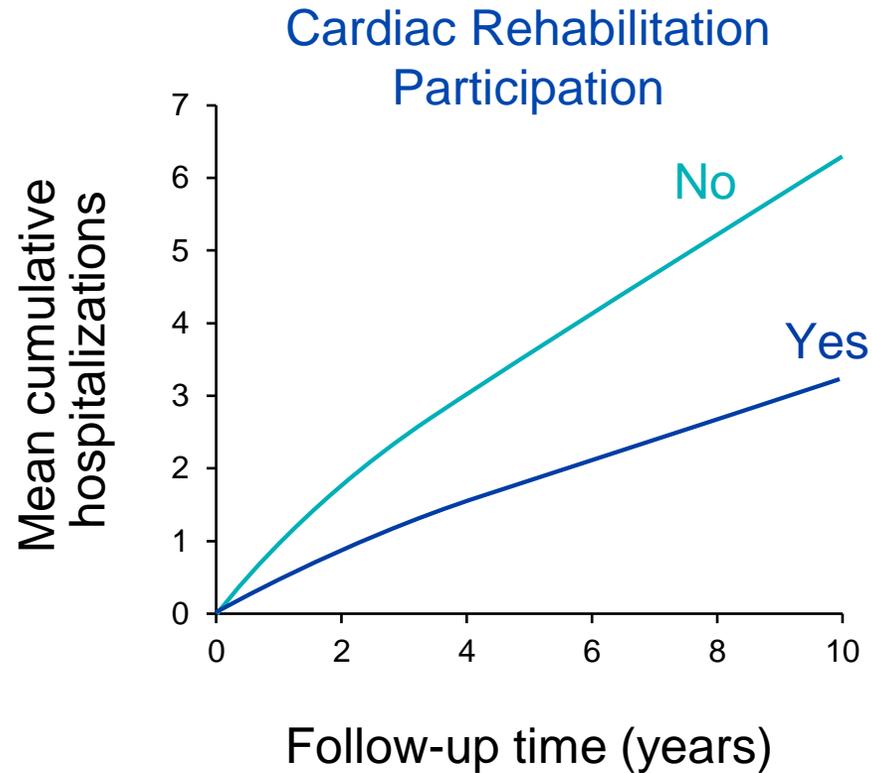
• \$10/pt/day (CAN)

Cardiac Rehabilitation

Impact on Re-admission Rates After MI

- Olmsted County, MN
- 2991 patients
- 1st time MI, 1987-2010
- 52% in CR
- CR = ↓ hospitalization

- All-cause: ↓ 25%
- CV: ↓ 20%
- Non-CV: ↓ 28%



Nonparticipant	980	739	529	346
Participant	1,491	1,282	1,078	877

ACCF/AHA Clinical Practice Guidelines

Cardiac Rehabilitation Recommendations

Patient Group	Recommendation	Evidence
CABG	1	A
STEMI	1	B
Unstable Angina/NSTEMI	1	B
Chronic Stable Angina/IHD	1	A
Heart Failure	1	B (IIa*)
CVD in Women	1	B
PCI	1	A

CABG: JACC 2011;58:e123-e210

STEMI: JACC 2013;61:e78-e140

UA/NSTEMI: JACC 2014; epub ahead of print:doi:10.1016/j.jacc.2014.09.017

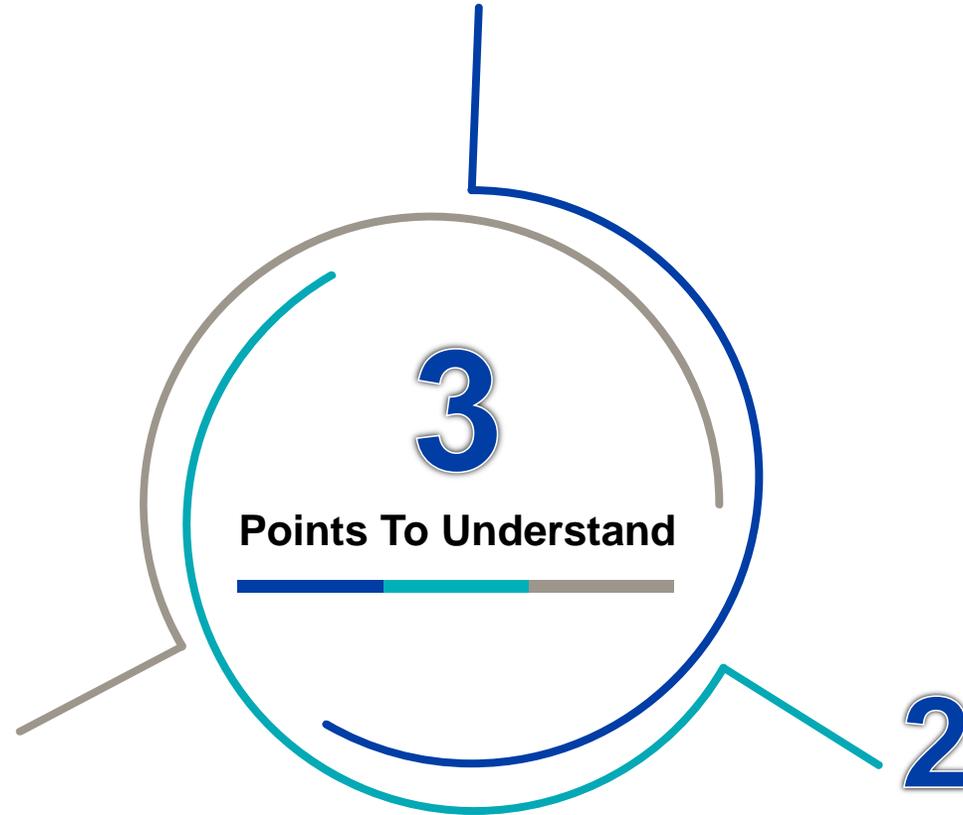
CSA/IHD: JACC 2012;60(24):2564-2603

HF: JACC 2013;62(16):e147-e239

Women: Circulation 2011;123:1243-62

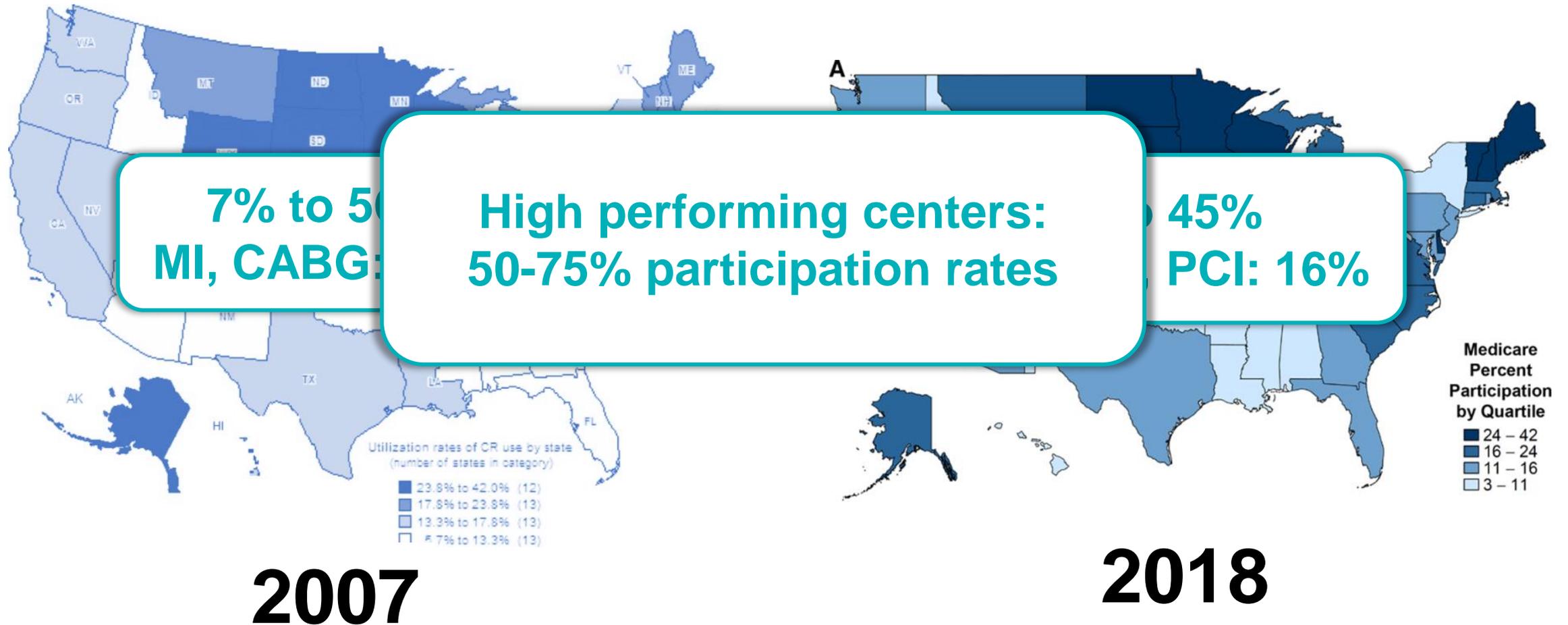
PCI: JACC 2011;58(24):e44-e122

1 Cardiac rehabilitation helps improve patient outcomes



2 Only a minority of eligible patients participate in CR

Geographic Variation in CR Participation: USA



Roadmap to 70% CR Participation

Cardiac Rehabilitation Adherence

- Set 36 CR Sessions as Goal
- Home-Based CR Option
- Flexible CR Hours
- Work to Minimize CR Co-Pays

3

Cardiac Rehabilitation Enrollment

- CR Staff Liaison
- Early Appointment at CR
- CR *Enrollment* as Performance Measure
- Work to Minimize Co-Pays

2

Cardiac Rehabilitation Referral

- EMR-Based Referral
- CR Staff Liaison
- CR *Referral* as Performance Measure

1

Roadmap to 70% CR Participation

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Cardiac Rehabilitation Referral

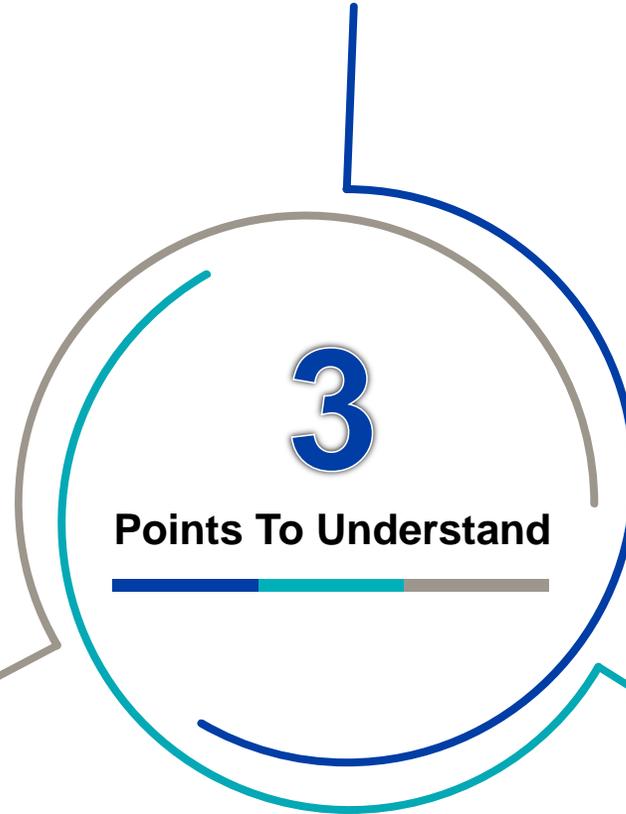
- EMR-Based Referral
- CR Staff Liaison
- CR *Referral* as Performance Measure

1

1 Cardiac rehabilitation helps improve patient outcomes

3 New delivery models will help CR grow

2 Only a minority of eligible patients participate in CR



Insufficient Capacity for CR Needs USA

- National survey
 - 812 CR programs surveyed
 - 290 (36%) response rate
 - 1.25 million eligible patients per year
- Current participation: 28% (of eligible patients)
- Maximum capacity: 37%
- Maximum capacity with growth: 47%

Cardiac Rehabilitation

Expanding Utilization and Impact

- Alternative intervention strategies
- Additional populations
- Alternative methods of delivery
 - Coverage policies
 - Locations
 - Technology tools

Care Assessment Platform (CAP) Smartphone-Based Cardiac Rehabilitation

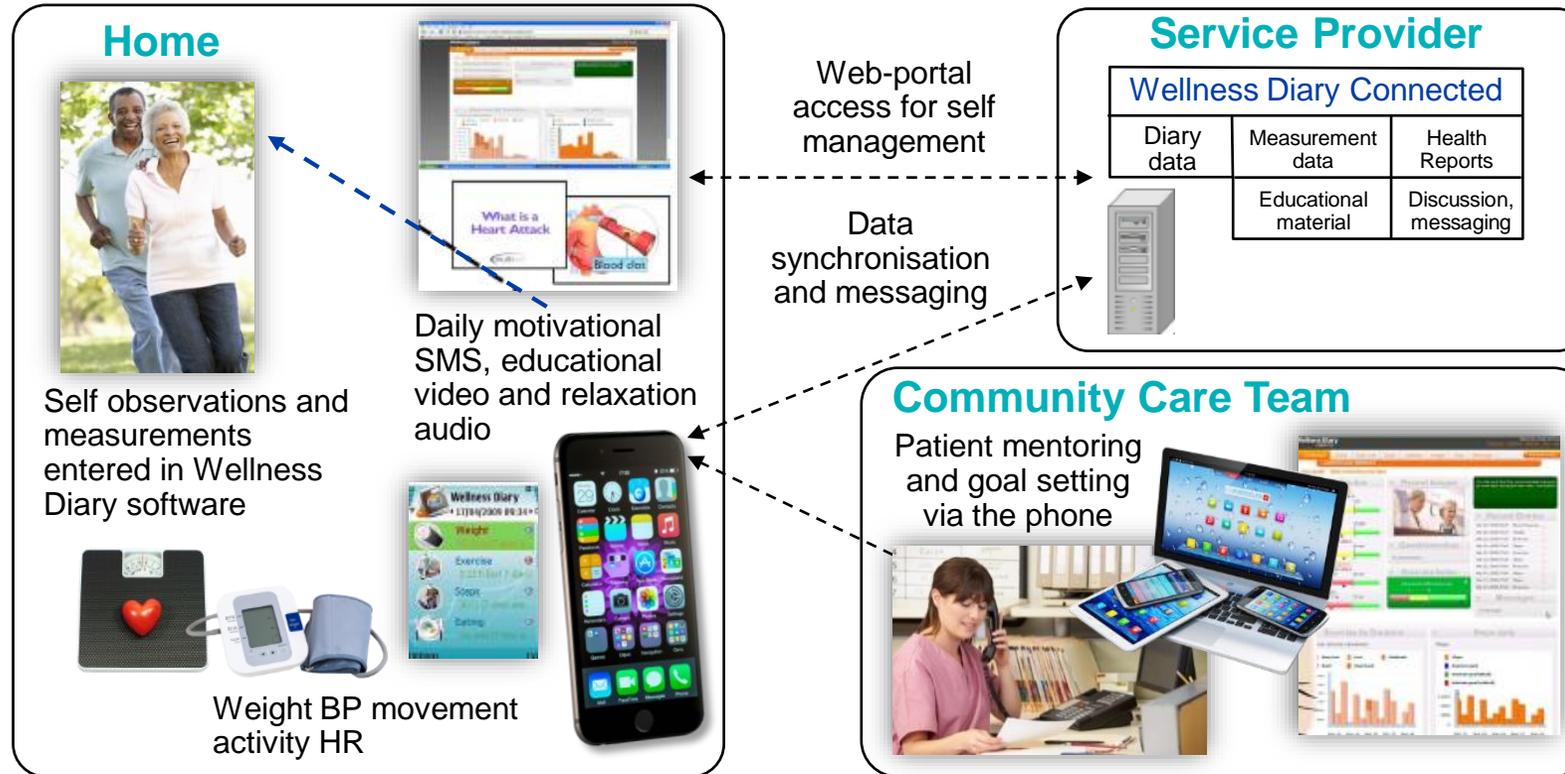
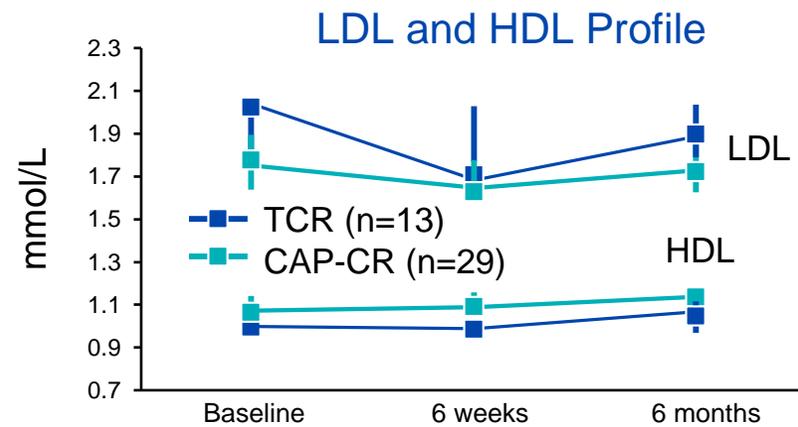
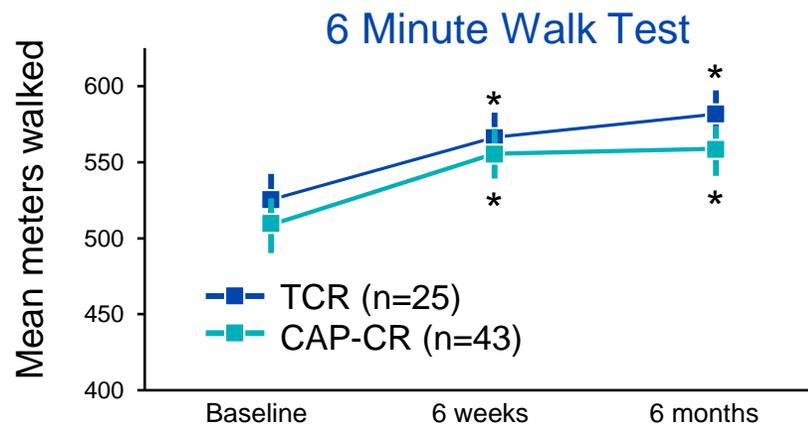


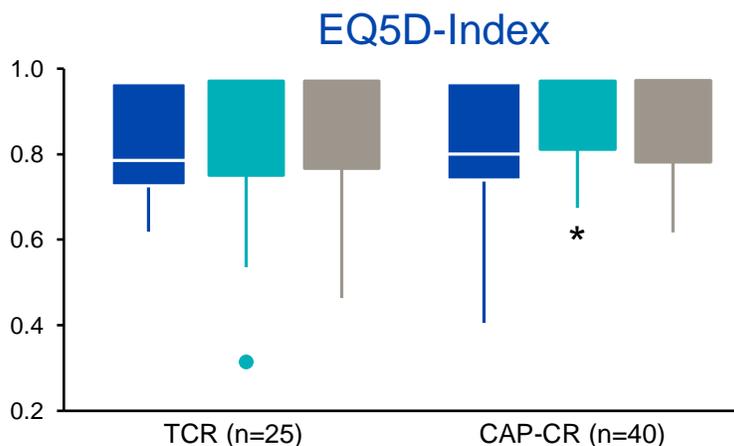
Figure 1 CAP System diagram. The mobile phone acts as the communication medium through which a) the Community Care Team provides mentoring and goal setting, b) daily motivations messages, educational videos and relaxation audio are sent, and c) self observations and measurements are entered to the Wellness Diary application. All data is synchronised and stored on a daily basis to a Wellness Diary Connected portal on a remote server

Care Assessment Platform (CAP) Smartphone-Based Cardiac Rehabilitation

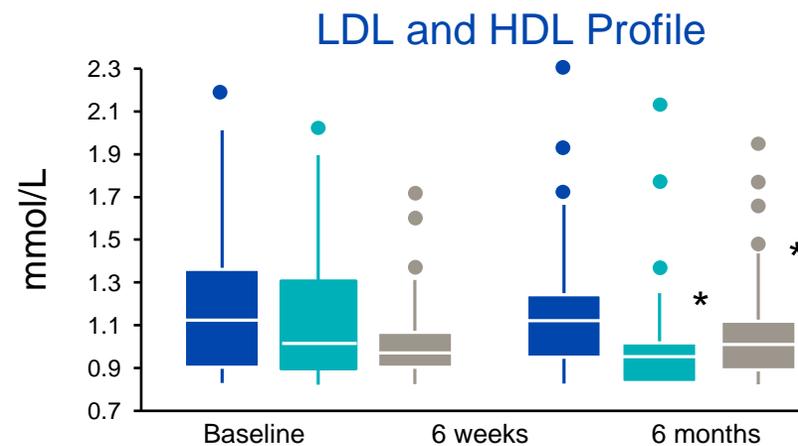


■ Baseline
■ 6 weeks
■ 6 months

*P < 0.06 from baseline



*P < 0.05 from baseline



*P < 0.05

Heart 20;100:1770-7914

Care Assessment Platform (CAP)

Smartphone-Based Cardiac Rehabilitation

	Home-based CR	Center-based CR	p
Uptake	80%	62%	<0.05
Adherence	94%	68%	<0.05
Completion	80%	48%	<0.05

Cardiac Rehabilitation

Mobile Health

- 2 Systematic Reviews
 - 11 trials
 - 15 trials
- “Mobile” CR = Center-based CR
 - Lifestyle change
 - Risk factor control
- More data needed for longer-term outcomes

Novel Cardiac Rehabilitation Delivery

Mobile Health-CR

Advantages

- Expands access
- May lower costs
- Growing need, options

Challenges

- Long validation time
- Long-term impact
- Financial viability

Home-based CR: AACVPR/ACC/AHA (2019)

- Center-based CR is standard of care
- Home-based CR is a consideration
 - Low to moderate risk patients
 - Unable to participate in CBCR
- HBCR—same components as CBCR
- Synchronous or asynchronous
- More studies are needed

Circulation

Volume 140, Issue 1, 2 July 2019, Pages e69-e89
<https://doi.org/10.1161/CIR.0000000000000663>

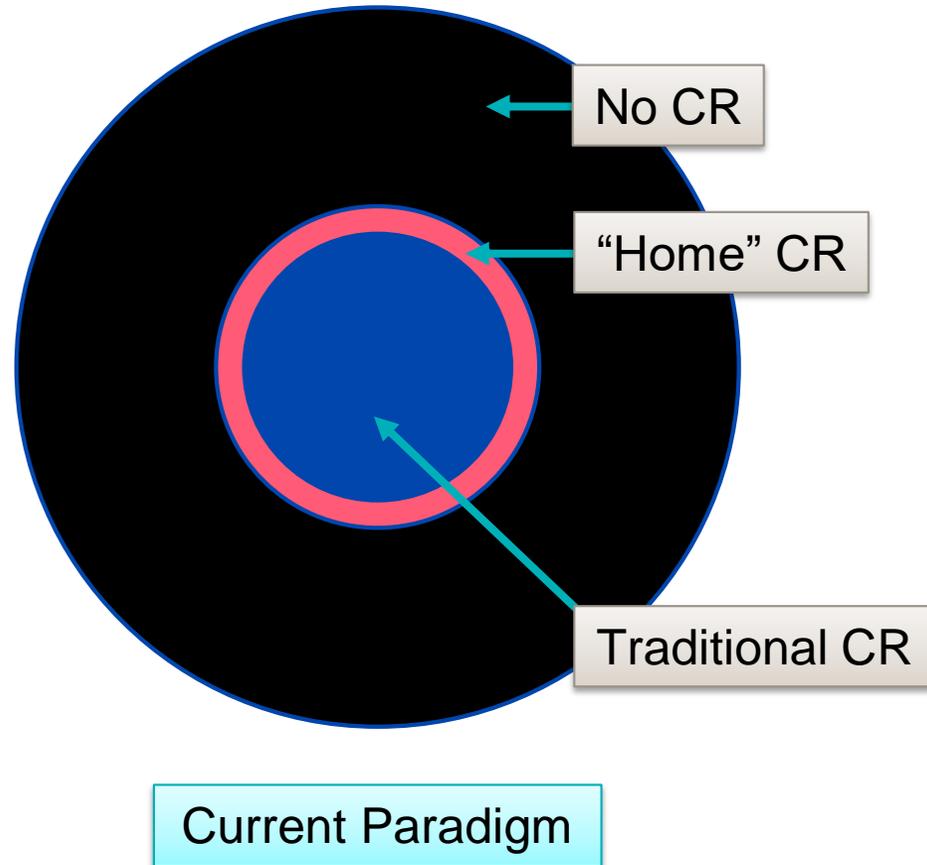


AACVPR/AHA/ACC SCIENTIFIC STATEMENT

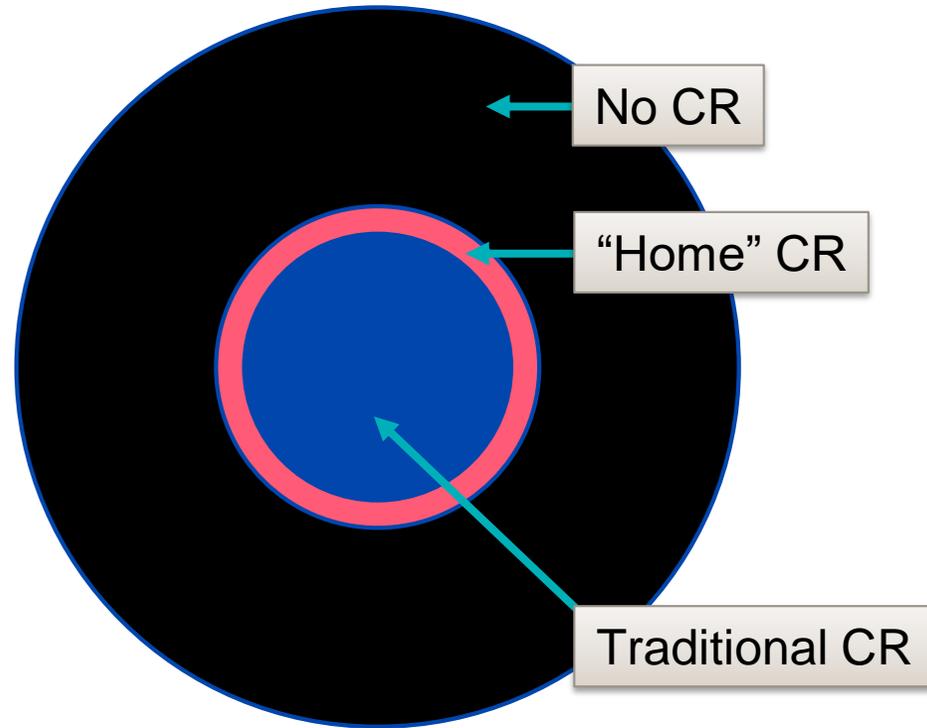
Home-Based Cardiac Rehabilitation: A Scientific Statement From the American Association of Cardiovascular and Pulmonary Rehabilitation, the American Heart Association, and the American College of Cardiology

Randal J. Thomas, MD, MS, MAACVPR, FAHA, FACC, Chair, Alexis L. Beatty, MD, MAS, MAACVPR, FACC, Theresa M. Beckie, PhD, MSN, FAHA, LaPrincess C. Brewer, MD, MPH, FACC, Todd M. Brown, MD, FAACVPR, FACC, Daniel E. Forman, MD, FAHA, FACC, Barry A. Franklin, PhD, MAACVPR, FAHA, Steven J. Keteyian, PhD, Dalane W. Kitzman, MD, FAHA, Judith G. Regensteiner, PhD, FAHA, Bonnie K. Sanderson, PhD, RN, MAACVPR, and Mary A. Whooley, MD, FAHA, FACC, Vice Chair

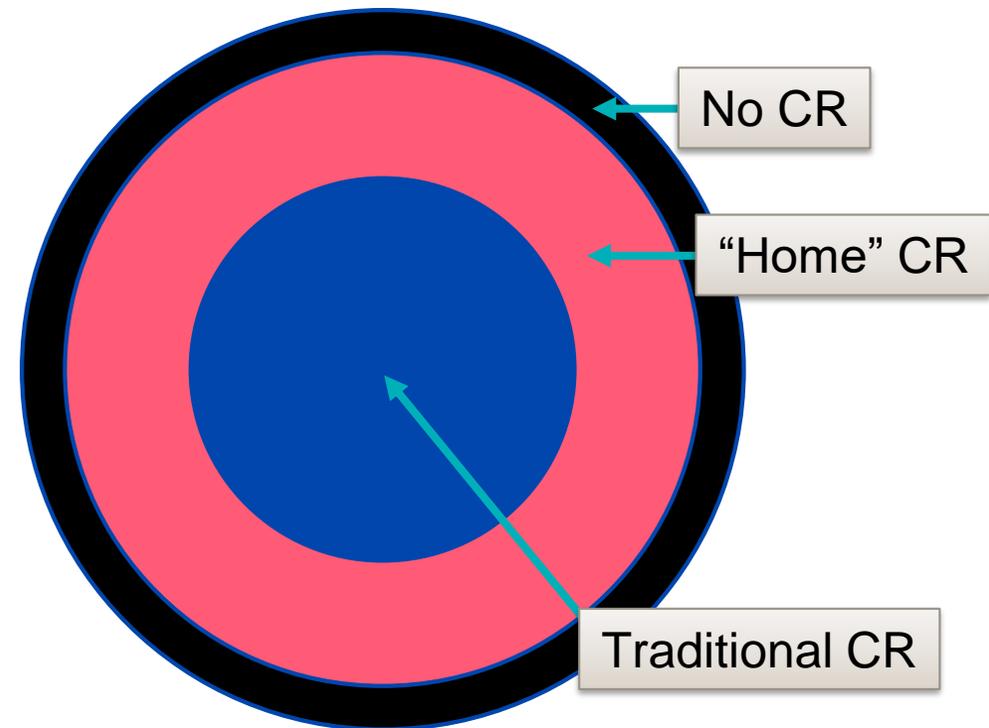
Cardiovascular Rehabilitation Paradigm Shift



Cardiovascular Rehabilitation Paradigm Shift

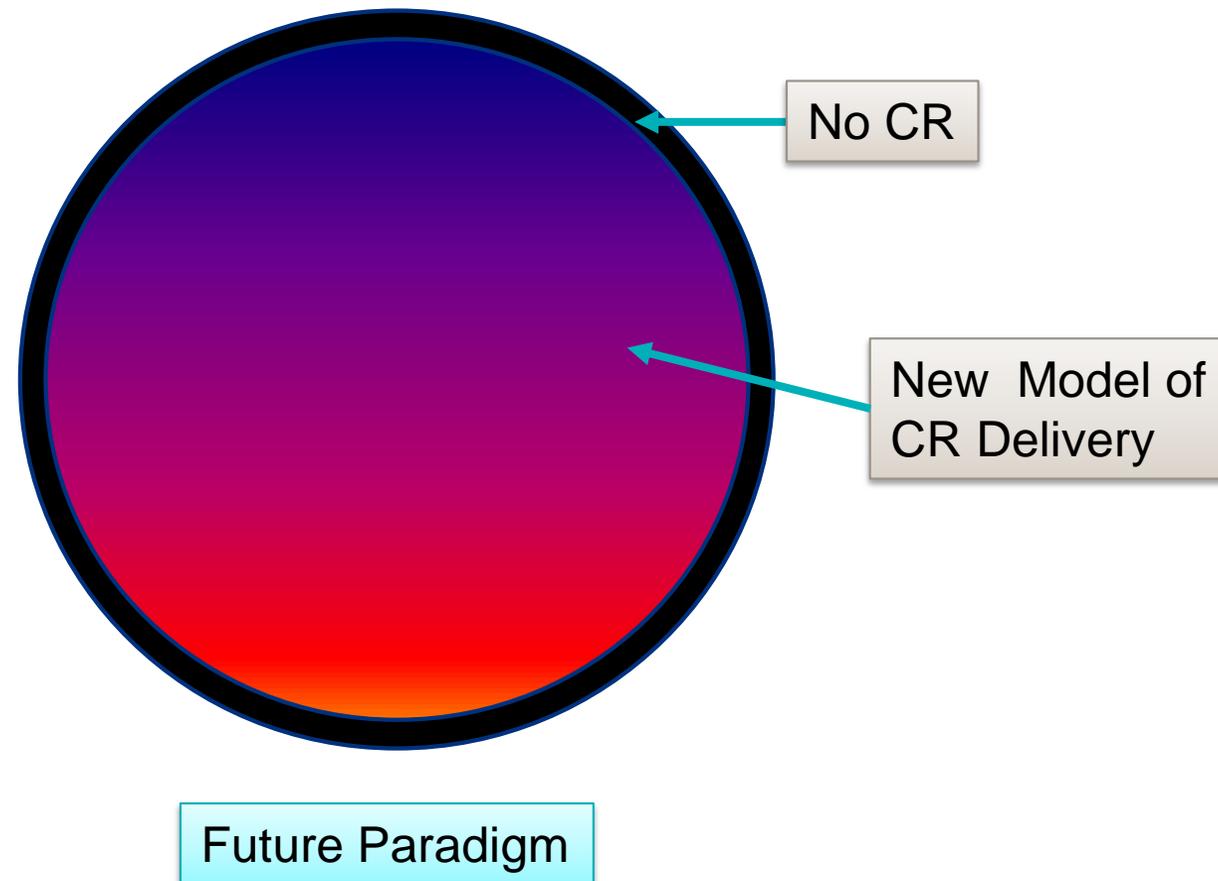


Past Paradigm



New Paradigm

Cardiovascular Rehabilitation Paradigm Shift



Summary

- **Cardiac rehabilitation helps improve patient outcomes**
- **Only a minority of eligible patients participate in CR**
- **New delivery models will help CR grow**



Thank you!

@ thomas.randal@mayo.edu

Disparities in the Utilization of Cardiac Rehabilitation and Opportunities for Alternative Delivery Models



By: Simone Bailey-Brown MD, FACC

Director of Cardiac Rehabilitation Services

Rochester Regional Health

Disclosures

- None

Objectives

- Review disparities in cardiac rehabilitation (CR) utilization
- Discuss factors contributing to disparities
- Examine the potential positive impact of alternative CR delivery models

Introduction

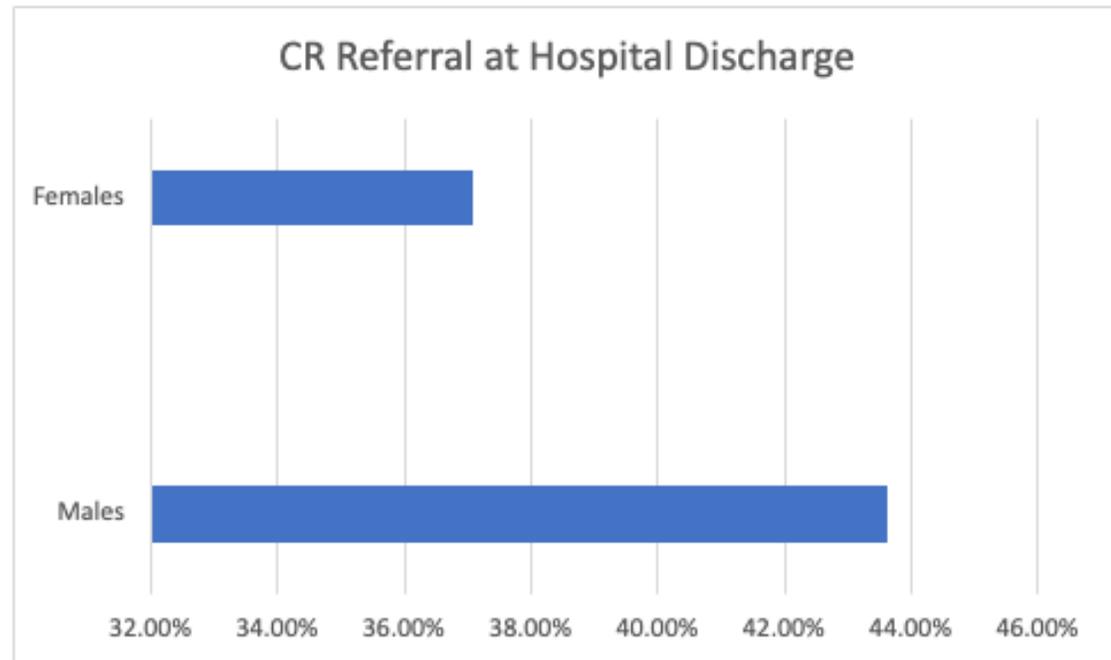
- Persistent disparities exist in the quality of cardiovascular (CV) care among women, racial/ethnic minorities and individuals of low socioeconomic status (SES)^{1,2}
- Individuals in these subgroups have a disproportionate burden of CV disease and worse outcomes in part due to untreated risk factors and poor access to care¹
- Despite the documented benefits of CR, referral and participation rates remain low in these individuals¹
- Reduced use of CR services in these patients will lead to further disparities in cardiac health outcomes¹

1. Mola A, et al. *US Cardiology* 2011;8(1):19–23

2. Ritchey MD, et al. *Circ Cardiovasc Qual Outcomes*. 2020;13:e005902

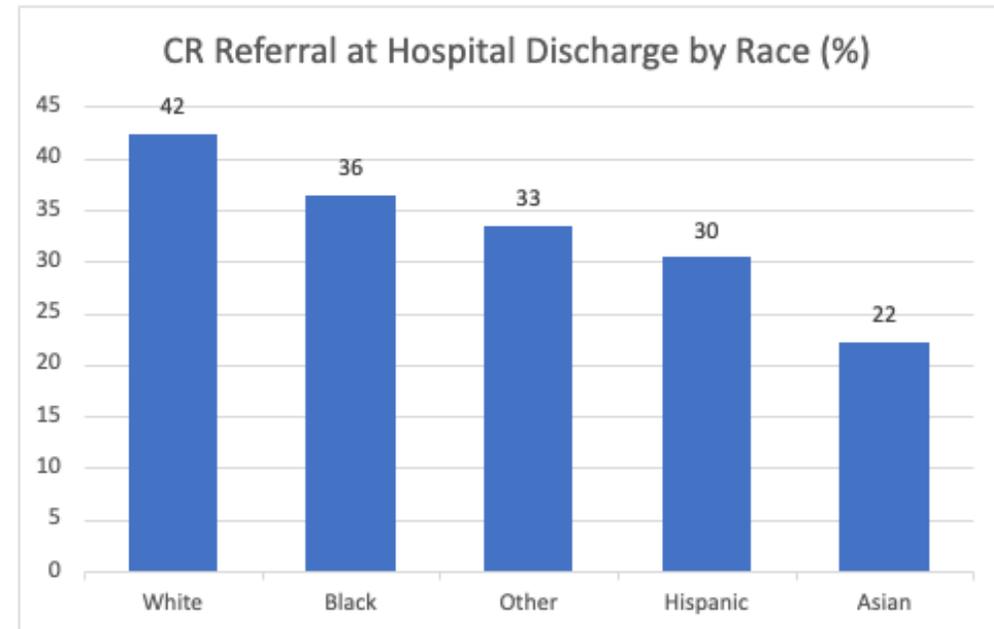
Disparities in CR Referral

- 48,993 patients ≥ 65 years in the GWTG-CAD registry linked with Medicare inpatient data from 365 hospitals across the US from 2003 – 2009
- 40% eligible patients were referred by their physician to an outpatient CR program at discharge
- Females were 12% less likely to receive CR referral compared with males



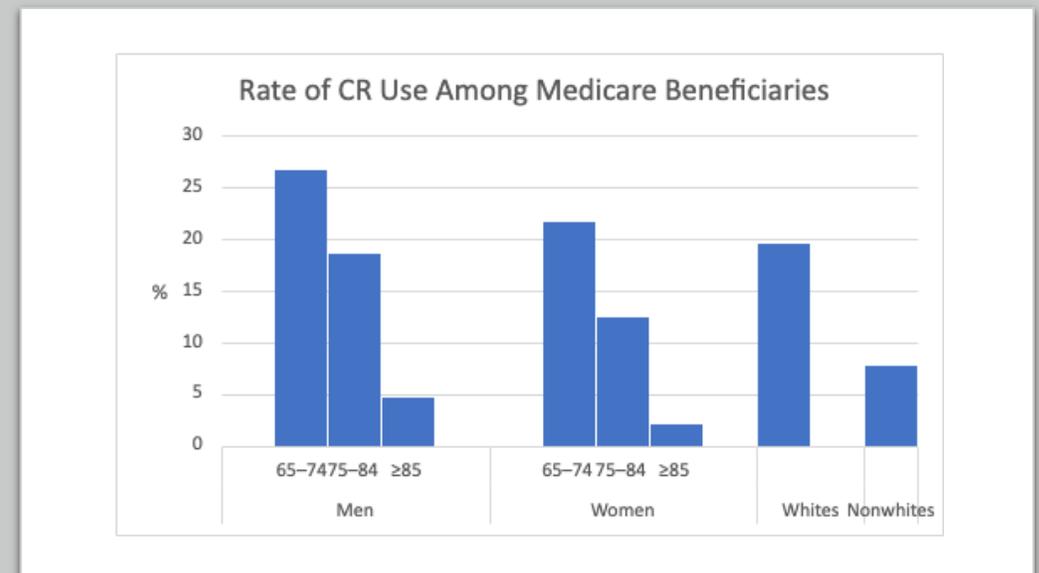
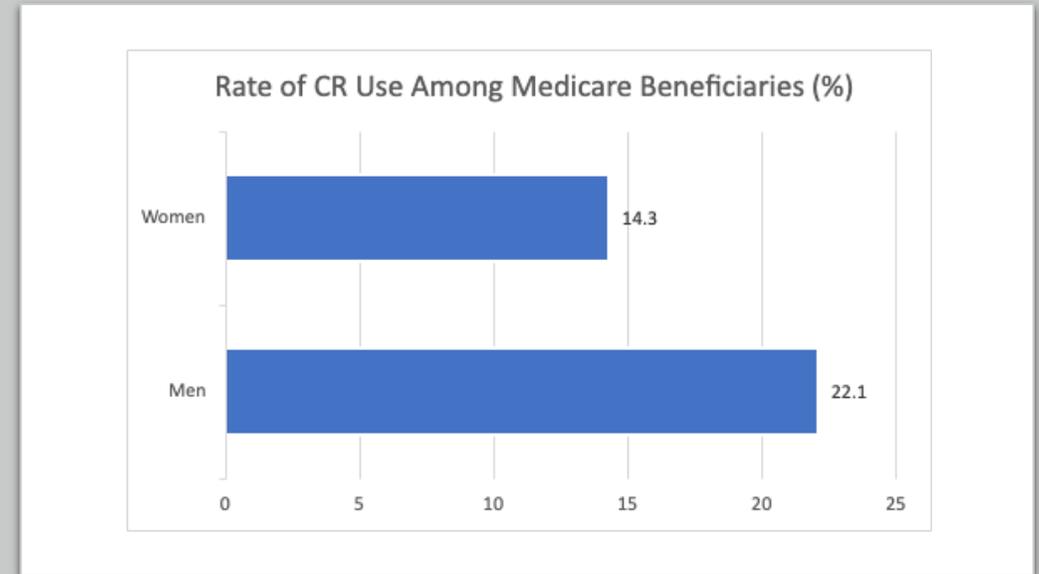
Disparities in CR Referral

- Black, Hispanic, and Asian patients were 20%, 36%, and 50% less likely, respectively, to receive CR referral than white patients
- CR referral was associated with 40% lower 3-year all-cause mortality



Disparities in CR Participation - 1997

- 267 427 fee-for-service Medicare beneficiaries ≥ 65 years who survived for at least 30 days after hospital discharge following acute MI or CABG in 1997
- 18.7% of eligible patients received at least 1 session of outpatient CR
- Sex differences increased with age
- Whites were 33% more likely to participate in CR than nonwhites after adjustment for age and sex
- Among low income patients only 5% received CR compared with 20.3% of those who were not
- Women, older people, nonwhites, and patients receiving Medicaid received fewer sessions on average



Disparities in CR Participation - 1997

- Patients with lower mean income, less education, and higher prevalence of disability were less likely to participate
- Greater distance from the patient's residence to a CR facility was a strong deterrent to CR use



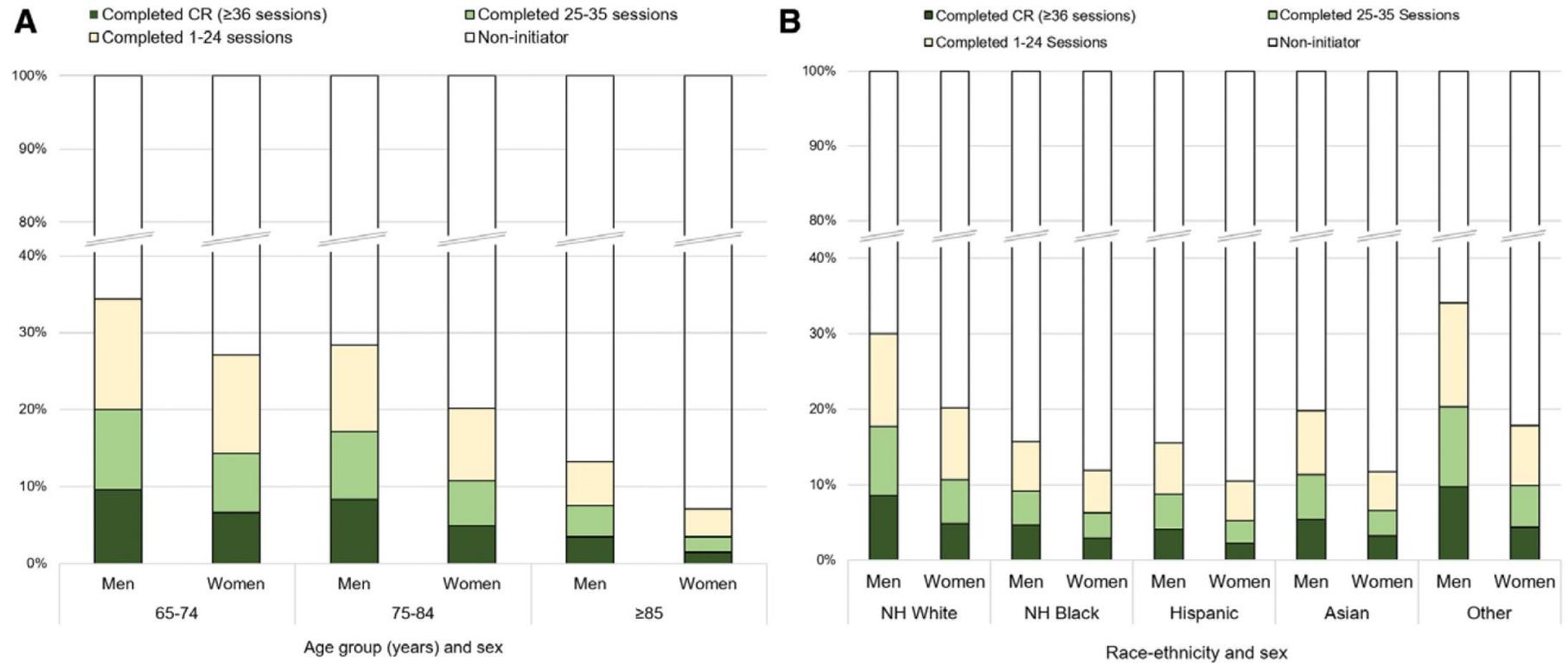
20 years later...

1997 - 2017

Disparities in CR Participation - 2017

- 366,103 Medicare fee-for-service beneficiaries ≥ 65 years who were CR eligible in 2016
- Assessed CR participation, timely initiation and completion through 2017
- Only 24% participated in CR of whom 24% started within 21 days and 27% completed CR
- Participation and completion rates were lower in women compared with men
- Disparities by sex increased with increasing age and several racial disparities were seen
- Women from ethnic minorities had particularly low rates
- Dual-eligible beneficiaries were less likely to participate in or complete CR

Cardiac rehabilitation participation and completion among eligible* Medicare fee-for-service beneficiaries aged ≥ 65 y, by (A) age and sex and (B) race-ethnicity and sex, 2016–2017.



Disparities in CR Participation - 2017

Ritchey, MD, et al. Circ Cardiovasc Qual Outcomes. 2020;13:e005902

Reasons for Disparities

System-Factors

- Lack of referral protocols
- Competition within markets
- Reimbursement issues
- Enrollment process
- Logistical barriers
- Parking
- Hours of operation
- High out of pocket cost
- Insurance coverage

Patient-Factors

- Uninformed about benefits
- Education and health literacy
- Cultural barriers
- Language barriers
- Perception of bias
- Work/family obligations
- Lack of transportation
- Anxiety/depression
- Poor social support
- Co-morbidities
- Dislike group exercise
- Perception of exercise

Provider-Factors

- Physician training
- Skepticism of CR benefits
- Perceived need
- Competing priorities
- Implicit bias and prejudice
- Physician-patient relationship
- Lack of cultural competency

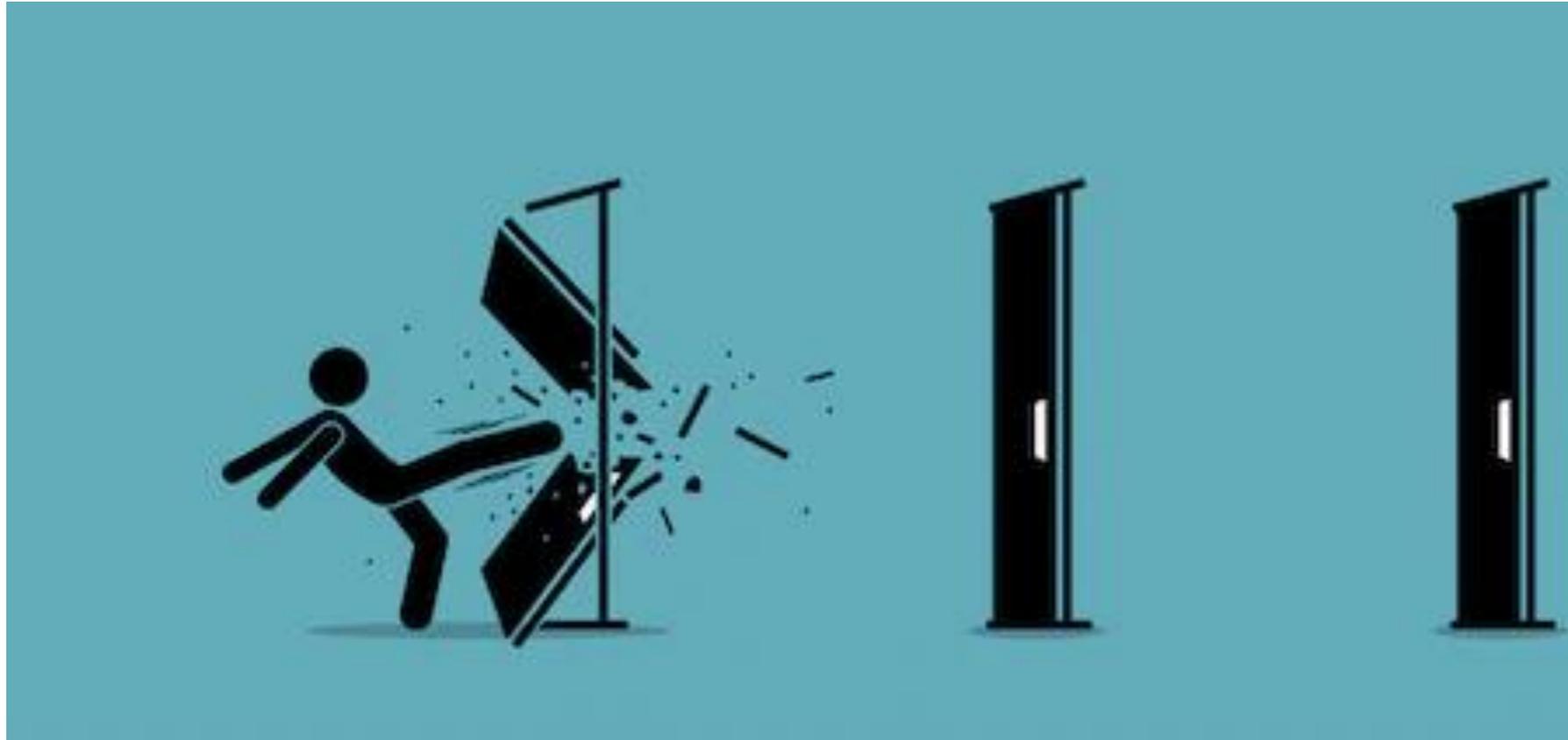
Balady GJ et al. *Circulation*. 2012;124; Beckie T & Beckstead J. *JCRP*. 2010; 30:147; Clark AM et al. *Am Heart J*. 2012;164:835; Sanderson BK. *JCR*. 2005;25:350-353; Suaya J et al. *Circulation*. 2007:116; Grace S et al. *J of Women's Health*. 2009:1z8; Rolfe DE et al. *JCN*. 2010; 25:332-341; Moore S. *JCR*. 1996; 123-129; Mola A, et al. *US Cardiology*. 2011;8(1):19-23; Mead H, et al. *Medical Care Research and Review*. 2016, Vol. 73(3) 251 -282



Reasons for Disparities – Impact of COVID-19

- Fear of infection
- Limited capacity due to the need for social distancing
- Masking requirements during exercise
- School disruptions

How Can We Break These Barriers ?





Opportunities for Alternative Delivery Models

Opportunities for Alternative Delivery Models

- Program accessibility in particular has been implicated as a barrier to CR participation and adherence¹
- Home-based exercise combined with trans-telephonic monitoring and surveillance is a safe, effective and convenient option for appropriately selected patients^{2,3}
- Case management and health coaching for risk factor reduction via telemedicine is an effective way to modify CHD risk factors and reduce recurrent events^{2,3}

1. Suaya JA, et al. *Circulation*. 2007;116:1653-1662

2. Debusk RF, et al. *Ann Intern Med*. 1994;120:721-729

3. Anderson L, et al. *Cochrane Database of Systematic Reviews* 2017

Advantages

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

Conclusion

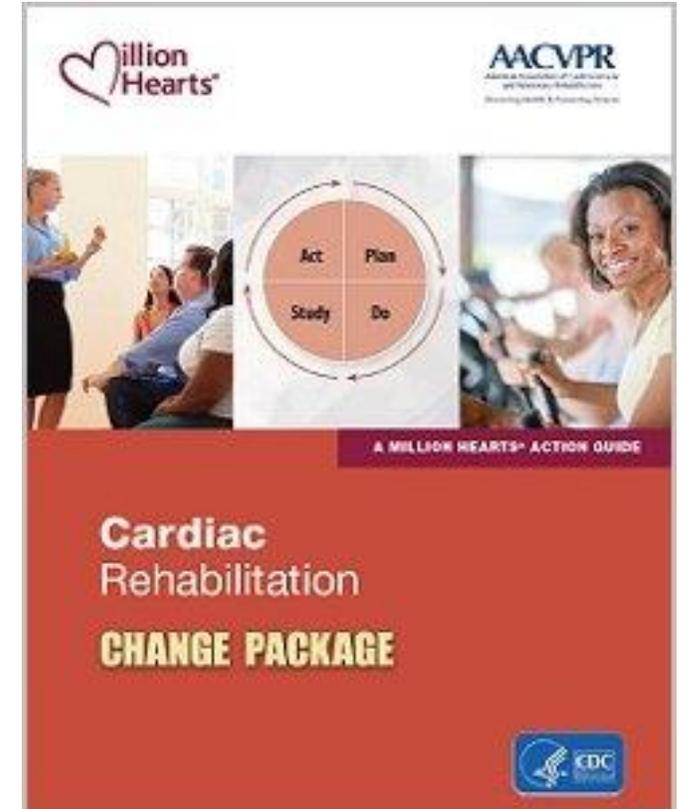
- Disparities exist in the utilization of CR by women, elderly, racial/ethnic minorities and individuals with low SES
- Systematic, patient and provider related factors co-exist to perpetuate this problem
- Overcoming these barriers requires a multifaceted approach
- Providing opportunities for patients to access the program in ways which are convenient and acceptable to them will help to overcome issues related to accessibility
- Broad implementation and insurance coverage of alternative delivery options is critical to reduce the gap in CR utilization within these groups

Questions & Answers



Million Hearts® CR Resources

- [Million Hearts® Cardiac Rehabilitation Webpage](#)
 - Available for syndication [here](#)
- [Million Hearts®/AACVPR Cardiac Rehabilitation Change Package](#)
 - [TAKEheart](#): the Agency for Healthcare Research and Quality's (AHRQ's) initiative to increase use of cardiac rehabilitation
- [Million Hearts® Cardiac Rehabilitation Collaborative](#)
- [Million Hearts® Outpatient Cardiac Rehabilitation Use Surveillance Methodology](#)
- [Million Hearts® Cardiac Rehabilitation Communications Toolkit](#)



See [Invited commentary](#) in the September 2020 Journal of Cardiopulmonary Rehabilitation and Prevention for more information on the Million Hearts® cardiac rehabilitation portfolio.

Thank You!

Contact millionheartscrc@cdc.gov
for questions, comments, or
feedback.

