מה חדש בשיקום לב?

ד"ר יצחק גביזון

המרכז הרפואי האוניברסיטאי סורוקה

אוניברסיטת בן גוריון בנגב

חולים לאחר ניתוח מסתמי

- בישראל לא בסל הבריאות אם לא נלווה לניתוח מעקפים
- נושא שפחות נבדק - יש פחות ספרות ברורה עם שיפור בתוצאים
- עם הזמן יש פרוצדורות חדשות כמו TAVI

Research

JAMA Cardiology | Original Investigation

Association of Cardiac Rehabilitation With Decreased Hospitalization and Mortality Risk After Cardiac Valve Surgery

Devin K. Patel, MD; Meredith S. Duncan, MA; Ashish S. Shah, MD; Brian R. Lindman, MD, MSc; Robert A. Greevy Jr, PhD; Patrick D. Savage, MS; Mary A. Whooley, MD; Michael E. Matheny, MD, MS, MPH; Matthew S. Freiberg, MD, MSc; Justin M. Bachmann, MD, MPH

JAMA Cardiol. doi:10.1001/jamacardio.2019.4032
Published online October 23, 2019.

שיקום בחולים אחרי ניתוחים מסתמיים

- בין השנים 2014-2015 נבדקו 41369 חולים שעברו ניתוח מסתמי
- החולים היו מבוטחי MEDICARE

Table 1. Baseline Characteristics of Medicare Beneficiaries Undergoing Cardiac Valve Surgery in 2014[a]

Characteristic	Patients, No. (%)		
		Cardiac Rehabilitation	
	All	Nonparticipants	Participants
Total	41 369	23 514 (56.8)	17 855 (43.2)
Demographic			
Age, median (IQR), y	73 (68-79)	73 (67-79)	73 (68-78)
Female	16 935 (40.9)	10 185 (43.3)	6750 (37.8)
Race			
Asian	357 (0.9)	286 (1.2)	71 (0.4)
Black	2305 (5.6)	1758 (7.5)	547 (3.1)
Hispanic	437 (1.1)	359 (1.5)	78 (0.4)
Native American	160 (0.4)	119 (0.5)	41 (0.2)
Other	797 (1.9)	455 (1.9)	342 (1.9)
White	37 313 (90.2)	20 537 (87.3)	16 776 (94.0)
County income, median (IQR), $	52 945 (45 733-62 591)	51 999 (44 258-61 797)	54 309 (47 083-63 478)
Census region			
Midwest	9924 (24.0)	4198 (17.9)	5726 (32.1)
Northeast	9106 (22.0)	5467 (23.3)	3639 (20.4)
West	7218 (17.5)	4239 (18.0)	2979 (16.7)
South	15 121 (36.5)	9610 (40.9)	5511 (30.9)

Table 1. Baseline Characteristics of Medicare Beneficiaries Undergoing Cardiac Valve Surgery in 2014[a]

Characteristic	Patients, No. (%)		
		Cardiac Rehabilitation	
	All	Nonparticipants	Participants
Total	41 369	23 514 (56.8)	17 855 (43.2)
Clinical			
Type of valve surgery			
Aortic	28 238 (68.3)	15 603 (66.4)	12 635 (70.8)
Mitral repair	3799 (9.2)	2086 (8.9)	1713 (9.6)
Mitral replacement	5068 (12.3)	3167 (13.5)	1901 (10.7)
Pulmonary	65 (0.2)	49 (0.2)	16 (0.1)
Tricuspid	484 (1.2)	352 (1.5)	132 (0.7)
Multiple	3715 (9.0)	2257 (9.6)	1458 (8.2)
Concomitant coronary artery bypass grafting	14 982 (36.2)	8132 (34.6)	6850 (38.4)
Cardiac rehabilitation program at surgical hospital	37 370 (90.6)	20 850 (89.0)	16 520 (92.8)
Discharged to inpatient rehabilitation or skilled nursing facility	15 613 (37.7)	10 289 (43.8)	5324 (29.8)
Length of stay, median (IQR), d	8 (6-12)	9 (6-14)	7 (5-10)
Comorbidities			
Alcohol dependence	1395 (3.4)	930 (4.0)	465 (2.6)
Anemia	2135 (5.2)	1419 (6.0)	716 (4.0)
Cardiac arrhythmia	30 040 (72.6)	17 222 (73.2)	12 818 (71.8)
Chronic pulmonary disease	17 065 (41.3)	10 567 (44.9)	6498 (36.4)
Congestive heart failure	20 123 (48.6)	12 681 (53.9)	7442 (41.7)
Depression	5340 (12.9)	3364 (14.3)	1976 (11.1)
Diabetes	13 614 (32.9)	8289 (35.3)	5325 (29.8)
Drug abuse	992 (2.4)	736 (3.1)	256 (1.4)
Hypertension	35 027 (84.7)	20 114 (85.5)	14 913 (83.5)
Hypothyroidism	7443 (18.0)	4229 (18.0)	3214 (18.0)
Liver disease	1760 (4.3)	1211 (5.2)	549 (3.1)
Obesity	9235 (22.3)	5253 (22.3)	3982 (22.3)
Other neurological disorders	3898 (9.4)	2665 (11.3)	1233 (6.9)
Peripheral vascular disease	9357 (22.6)	5615 (23.9)	3742 (21.0)

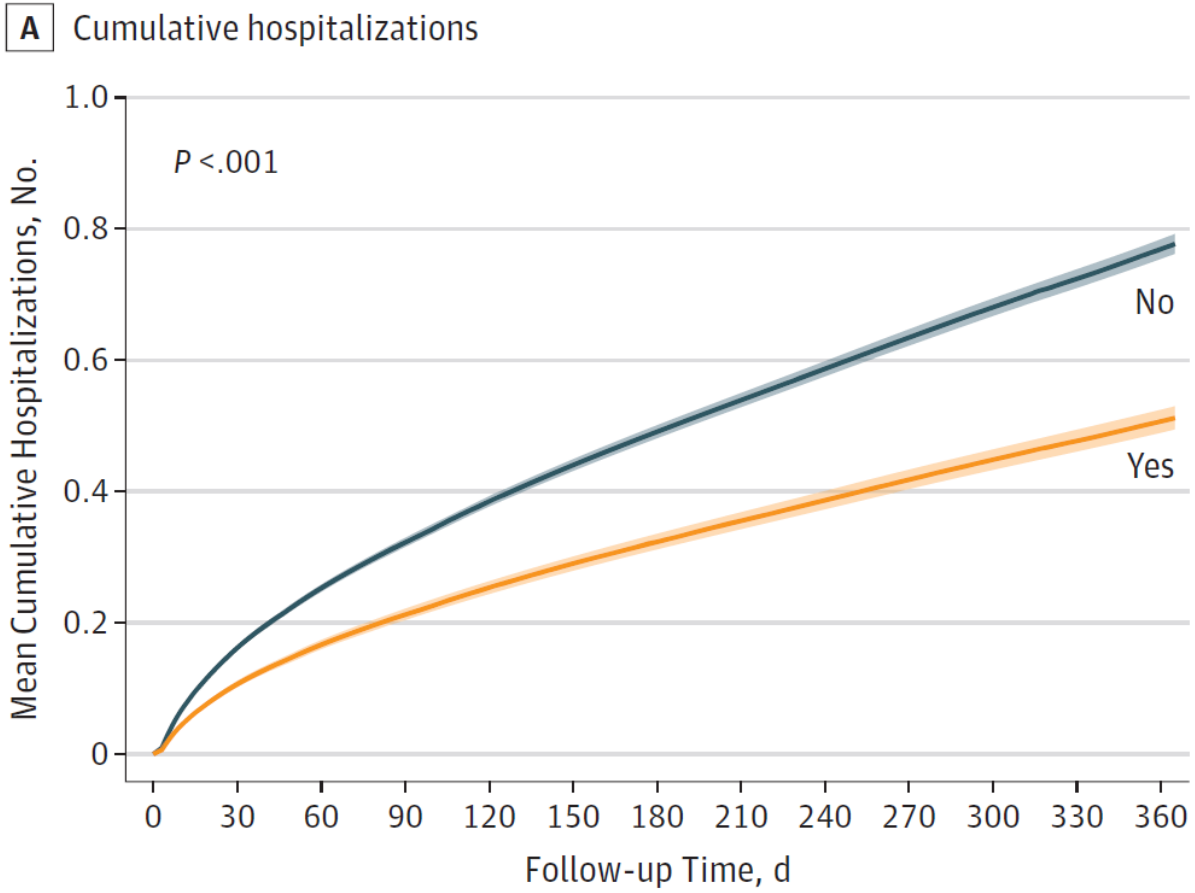
Table 2. Association of Cardiac Valve Surgery Type With Cardiac Rehabilitation Enrollment and Attendance Among Medicare Beneficiaries

Characteristic	Proportion of Patients Enrolling in Cardiac Rehabilitation, %	Enrollment in a Cardiac Rehabilitation Program		Sessions Attended, Median (IQR)	Change in Sessions Attended (95% CI)[a]	*P* Value
		Odds Ratio (95% CI)[a]	*P* Value			
All	17 855 (43.2)	NA	NA	32 (18-36)	NA	NA
Type of cardiac valve surgery						
Aortic	12 635 (44.7)	1 [Reference]		32 (18-36)	0 [Reference]	
Mitral repair	1713 (45.1)	1.05 (0.97-1.13)		32 (18-36)	0.32 (−0.29 to 0.93)	
Mitral replacement	1901 (37.5)	1.04 (0.97-1.12)	<.001	33 (17-36)	0.25 (−0.34 to 0.85)	.76
Tricuspid	132 (27.3)	0.81 (0.65-1.01)		28 (18-36)	−0.20 (−2.23 to 1.82)	
Pulmonary	16 (24.6)	0.46 (0.25-0.83)		23 (16-36)	2.50 (−3.25 to 8.26)	
Multiple	1458 (39.3)	1.16 (1.07-1.25)		32 (18-36)	0.29 (−0.38 to 0.95)	
Concomitant CABG	6850 (45.7)	1.26 (1.20-1.31)	<.001	33 (18-36)	0.46 (0.09 to 0.83)	.01
Demographic						
Age, per 5-y increase	NA	1.04 (1.03-1.06)	<.001	NA	0.70 (0.57 to 0.83)	<.001
Sex						
Male	11 105 (45.5)	1.17 (1.12-1.23)	<.001	33 (18-36)	1.08 (0.69 to 1.46)	<.001
Female	6750 (39.9)	1 [Reference]		31 (17-36)	0 [Reference]	
Race						
Asian	71 (19.9)	0.36 (0.28-0.47)		24 (12-35)	−3.26 (−5.99 to −0.53)	
Black	547 (23.7)	0.60 (0.54-0.67)		30 (12-36)	−1.24 (−2.26 to −0.21)	
Hispanic	78 (17.9)	0.36 (0.28-0.46)		27 (12-36)	−1.88 (−4.48 to 0.73)	
Native American	41 (25.6)	0.52 (0.36-0.75)	<.001	20 (9-30)	−4.60 (−8.19 to −1.01)	.002
Other	342 (42.9)	0.94 (0.81-1.09)		31 (18-36)	−0.03 (−1.29 to 1.23)	
White	16 776 (45.0)	1 [Reference]		32 (18-36)	0 [Reference]	

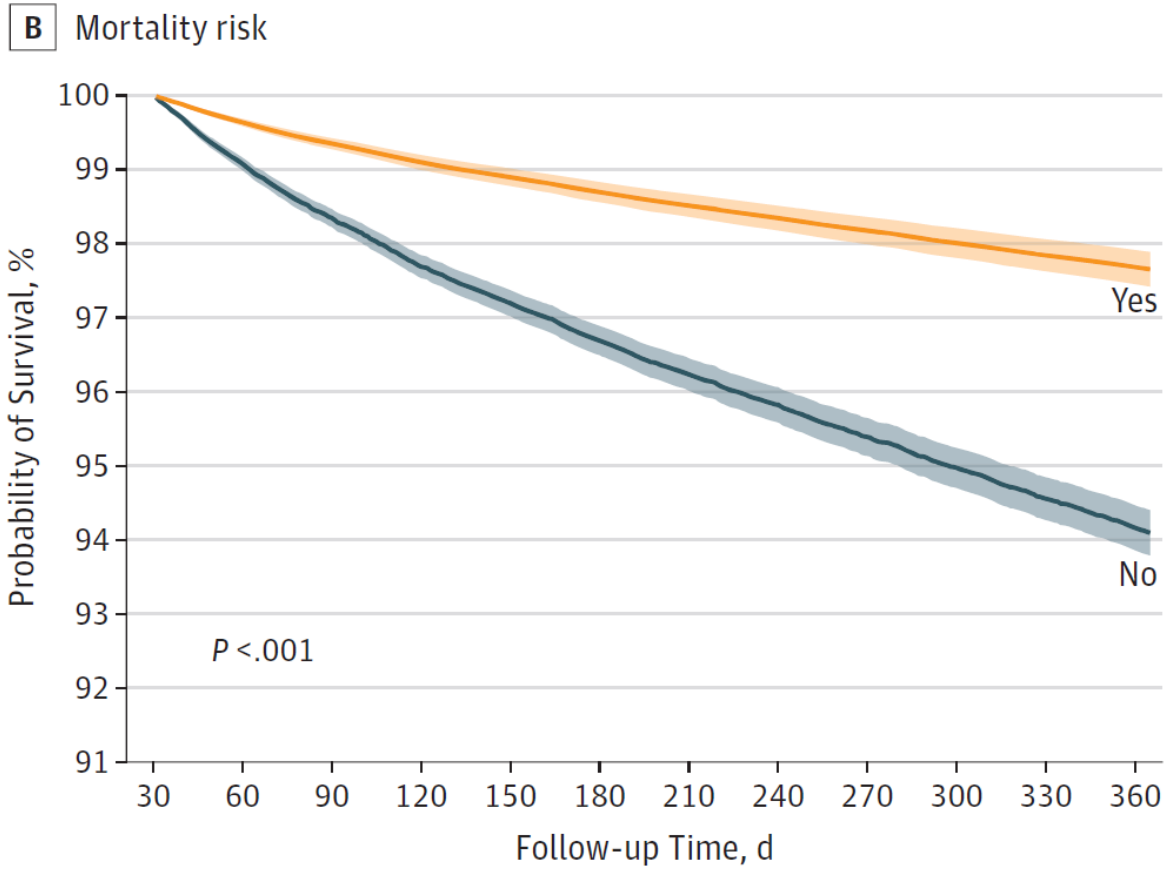
Table 2. Association of Cardiac Valve Surgery Type With Cardiac Rehabilitation Enrollment and Attendance Among Medicare Beneficiaries

Characteristic	Proportion of Patients Enrolling in Cardiac Rehabilitation, %	Enrollment in a Cardiac Rehabilitation Program		Sessions Attended, Median (IQR)	Change in Sessions Attended (95% CI)[a]	
		Odds Ratio (95% CI)[a]	*P* Value			*P* Value
Median county income, per $10 000 increase		1.09 (1.07-1.10)	<.001	NA	0.09 (−0.04 to 0.21)	.17
Census region						
Midwest	5726 (57.7)	2.40 (2.28-2.54)	<.001	30 (18-36)	−1.12 (−1.56 to −0.69)	<.001
Northeast	3639 (40.0)	1.06 (1.00-1.13)		33 (19-36)	−0.33 (−0.84 to 0.19)	
West	2979 (41.3)	1.10 (1.04-1.17)		32 (16-36)	−1.37 (−1.90 to −0.84)	
South	5511 (36.5)	1 [Reference]		34 (18-36)	0 [Reference]	
Clinical						
Length of stay, per 5-d increase	NA	0.80 (0.79-0.82)	<.001	NA	0.13 (−0.05 to 0.31)	.17
Discharged to inpatient rehabilitation or skilled nursing facility	5324 (34.1)	0.66 (0.62-0.69)	<.001	33 (19-36)	0.47 (0.06 to 0.88)	.02
Comorbidities						
Alcohol dependence	465 (33.3)	0.76 (0.67-0.86)	<.001	29 (15-36)	−0.97 (−2.06 to 0.13)	.08
Anemia	716 (33.5)	0.92 (0.83-1.02)	.10	31 (18-36)	0.38 (−0.51 to 1.27)	.40
Cardiac arrhythmia	12,818 (42.7)	1.10 (1.05-1.16)	<.001	32 (18-36)	0.14 (−0.26 to 0.54	.49
Chronic pulmonary disease	6498 (38.1)	0.89 (0.84-0.94)	<.001	31 (17-36)	−1.04 (−1.52 to −0.57)	<.001
Congestive heart failure	7442 (37.0)	0.84 (0.80-0.88)	<.001	32 (17-36)	−0.19 (−0.57 to 0.19)	.34
Depression	1976 (37.0)	0.93 (0.87-0.99)	.03	28 (14-36)	−1.37 (−1.93 to −0.81)	<.001
Diabetes	5325 (39.1)	0.87 (0.84-0.92)	<.001	32 (17-36)	−0.21 (−0.60 to 0.19)	.31
Drug abuse	256 (25.8)	0.67 (0.58-0.78)	<.001	24 (12-36)	−2.15 (−3.61 to −0.69)	.004
Hypertension	14 913 (42.6)	0.95 (0.90-1.01)	.10	32 (18-36)	0.42 (−0.05 to 0.90)	.08
Hypothyroidism	3214 (43.2)	1.10 (1.04-1.17)	<.001	33 (18-36)	0.19 (−0.27 to 0.65)	.42
Liver disease	549 (31.2)	1.02 (0.91-1.14)	.80	31 (17-36)	−0.09 (−1.10 to 0.93)	.87

אישפוזים חוזרים



הישרדות


B
Mortality risk
100
99
98
97
96
95
94
93
92
91
Probability of Survival, %
Yes
No
P <.001
30
60
90
120
150
180
210
240
270
300
330
360
Follow-up Time, d

גורמי סיכון נוספים לאשפוזים חוזרים בשיקום

Table 4. Association of 1-Year Mortality Risk With Cardiac Rehabilitation Enrollment Among Medicare Beneficiaries Undergoing Cardiac Valve Surgery in 2014

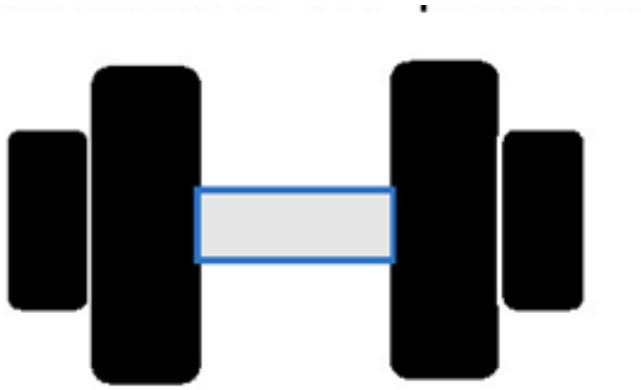
Characteristic	1-y Mortality Risk	
	Hazard Ratio (95% CI)[a]	*P* Value
Cardiac rehabilitation enrollment	0.39 (0.35-0.44)	<.001
Demographic		
Age (5-y increase)	1.05 (1.03-1.08)	<.001
Sex		.04
Male	1.09 (1.01-1.19)	
Female	1 [Reference]	
Race		
Asian	1.12 (0.78-1.60)	.55
Black	1.04 (0.89-1.21)	
Hispanic	1.12 (0.82-1.53)	
Native American	1.29 (0.80-2.09)	
Other	1.22 (0.94-1.58)	
White	1 [Reference]	
Median county income ($10 000 increase)	0.99 (0.97-1.02)	.54
Census region		
Midwest	1.09 (0.99-1.21)	<.001
Northeast	0.81 (0.72-0.90)	
West	0.96 (0.86-1.08)	
South	1 [Reference]	
Clinical		
Type of valve surgery[b]		
Aortic	1 [Reference]	<.001
Mitral repair	0.96 (0.83-1.12)	
Mitral replacement	1.24 (1.11-1.39)	
Tricuspid	1.10 (0.82-1.48)	
Multiple	1.18 (1.04-1.34)	
Concomitant coronary artery bypass graft	1.14 (1.05-1.23)	.002
Length of stay (5-d increase)	1.13 (1.11-1.15)	<.001
Discharged to inpatient rehabilitation or skilled nursing facility	1.92 (1.76-2.10)	<.001
Rheumatoid arthritis	1.22 (1.05-1.43)	.01
Solid tumor	1.49 (1.21-1.82)	<.001
Weight loss	1.48 (1.33-1.65)	<.001
Comorbidities		
Alcohol dependence	1.03 (0.84-1.26)	.81
Anemia	1.03 (0.90-1.19)	.68
Cardiac arrhythmia	1.27 (1.14-1.41)	<.001
Chronic pulmonary disease	1.25 (1.13-1.39)	<.001
Congestive heart failure	1.32 (1.21-1.45)	<.001
Depression	0.96 (0.86-1.07)	.49
Diabetes	1.23 (1.14-1.34)	<.001
Drug abuse	1.35 (1.11-1.64)	.002
Hypertension	0.95 (0.84-1.08)	.46
Hypothyroidism	1.05 (0.95-1.15)	.37
Liver disease	1.31 (1.13-1.51)	<.001
Obesity	0.87 (0.79-0.96)	.004
Other neurological disorders	1.41 (1.27-1.56)	<.001
Peripheral vascular disease	1.22 (1.12-1.33)	<.001
Pulmonary circulation disorders	0.99 (0.89-1.11)	.87
Renal failure	1.61 (1.48-1.76)	<.001

מסקנות :

- רק חצי מהחולים שהיו זכאים לשיקום למעשה הגיעו לשיקום
- הגעה לשיקום לב נמצאת באסוציאציה לשיפור בתמותה ואישפוזים חוזרים
- קיימים פערים גדולים בין קבוצות שונות

אימוני תנגודת טוב או רע? ואיזה ?

- ההנחיות ממליצות להוסיף אימוני התנגדות אבל השאלה היא איזה ?
- האם זה טוב לכולם ? יתר לחץ דם? אי ספיקת לב? וכו..



European Journal of Preventive Cardiology

ESC European Society of Cardiology

Clinical practice

European Journal of Preventive Cardiology
2019, Vol. 26(14) 1483–1492

DOI: 10.1177/2047487319847003
journals.sagepub.com/home/cpr

SAGE

Dynamic strength training intensity in cardiovascular rehabilitation: is it time to reconsider clinical practice? A systematic review

Dominique Hansen[1,2,3], Ana Abreu[4], Patrick Doherty[5] and Heinz Völler[6,7]

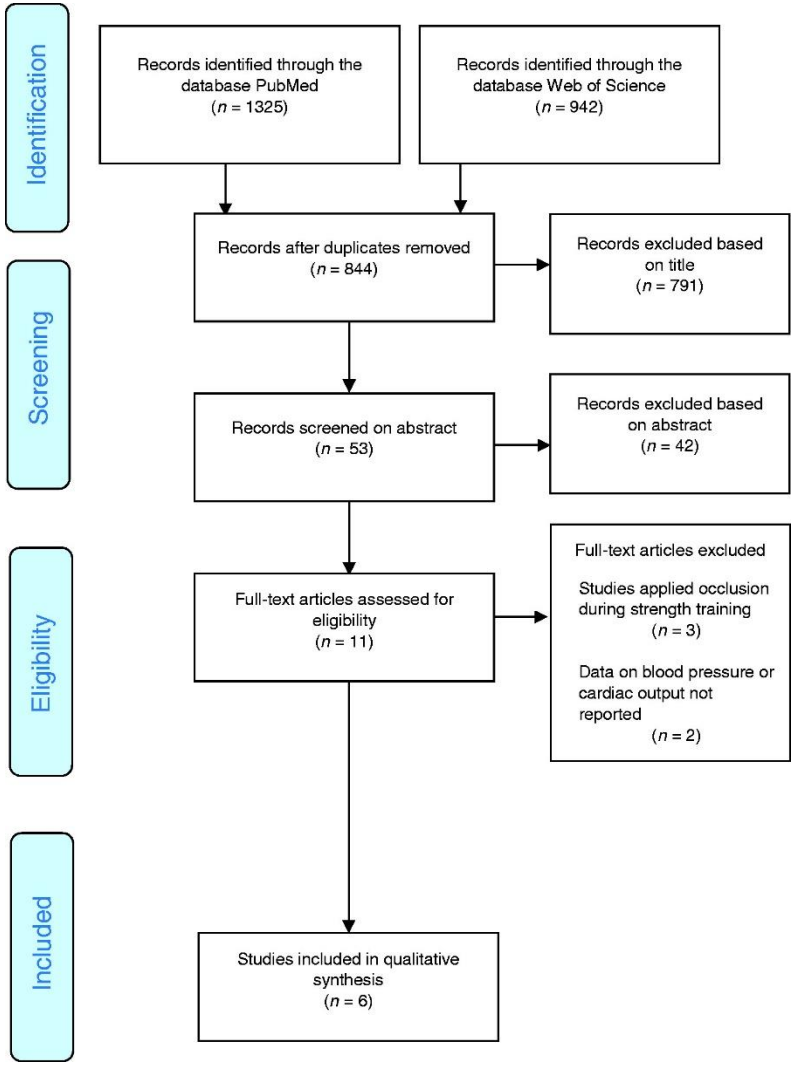


Figure 1. PRISMA flow diagram of the literature search.

DOI: (10.1177/2047487319847003)

	Lamotte, et al.[24]	de Souza Nery, et al.[25]	de Sousa, et al.[23]	Gløvaag, et al.[26]	Sardeli, et al.[27]	Gjøvaag, et al.[28]
1. Eligibility criteria were specified	+	+	+	+	+	+
2. Subjects were randomly allocated an order in which treatments were received	+	+	−	+	+	+
3. Allocation was concealed	+	+	−	+	+	+
4. The groups were similar at baseline regarding the most important prognostic indicators	NA	NA	NA	NA	NA	NA
5. There was blinding of all subjects	−	−	−	−	−	−
6. There was blinding of all therapists who administered the therapy	−	−	−	−	−	−
7. There was blinding of all assessors who measured at least one key outcome	−	−	−	−	+	−
8. Measures of at least one key outcome were obtained from more than 85% of the subjects initially allocated to groups	+	+	+	+	+	+
9. All subjects for whom outcome measures were available received the treatment or control condition as allocated or, when this was not the case, data for at least one key outcome were analysed by 'intention to treat'	+	+	+	+	+	+
10. The results of between-group statistical comparisons were reported for at least one key outcome	+	+	+	+	+	+
11. The study provided both point measures and measures of variability for at least one key outcome	+	+	+	+	+	+
Final score	6	6	4	6	7	6
Quality	G	G	M	G	G	6

+: yes; −: no; G: good; M: moderate.

Table 1. Quality assessment of the randomised controlled crossover trials ($n = 6$).

DOI: (10.1177/2047487319847003)

Study	Participants	Outcomes and methods	Resistance training sessions	Findings
Lamotte et al.[24]	14 Patients with coronary artery disease or valve disease (age 46–72 years)	Heart rate was recorded by ECG. BP was recorded beat by beat using a validated volume oscillometric method	Four sets of 17 repetitions at 40% of 1-RM vs. four sets of 10 repetitions at 70% of 1-RM on a leg extension machine	The heart rate and systolic BP during low-intensity resistance training were always greater than during high intensity ($P < 0.001$)
de Souza Nery et al.[25]	10 Hypertensive and 10 normotensive subjects (9 men, 11 women, mean age 46 ± 3 and 39 ± 2 years, respectively)	Intra-arterial BP was measured continuously in the radial artery	Three sets of knee extension exercises to exhaustion: 40% of 1-RM with a 45-second rest between sets, vs. 80% of 1-RM with a 90-second rest interval between sets	The mean increase in systolic BP was greater during exercise performed at 40% of 1-RM than at 80% of 1-RM (hypertensives $+86 \pm 4$ vs. $+74 \pm 4$ mmHg; normotensives $+63 \pm 3$ vs. $+60 \pm 3$ mmHg; $P<0.05$)
de Sousa et al.[23]	Seven normotensive healthy men (age 26 ± 3 years)	The BP and heart rate were measured simultaneously by a photoplethysmographic method	Incremental 1-minute stages at different percentage of 1-RM, with 2-minute recovery between sets, starting with 10% of 1-RM and followed by 20, 25, 30, 35, 40, 50, 60, 70 and 80% of 1-RM or until exhaustion	The increase in systolic BP was approximately 60% higher in 70% of 1-RM (1.3 ± 0.3 mmHg/s) than in 40% of 1-RM (0.8 ± 0.4 mmHg/s)
Gløvaag et al.[26]	Men ($n = 11$) and women ($n = 4$) treated with PCI or CABG (age 64 ± 7 years)	Beat-to-beat systolic and diastolic BP, heart rate, stroke volume, cardiac output were monitored continuously by ECG, echocardiography and finger photoplethysmograpic method	Three sets of 15-RM and 4-RM strength exercise in a randomised order on separate days	Systolic and diastolic BP were higher during 15-RM vs. 4-RM (both $P < 0.001$). Heart rate increased more following 15-RM compared to 4-RM ($P < 0.05$): a higher cardiac output following 15-RM (compared to 4-RM; $P < 0.05$) was mainly caused by higher heart rate
Sardeli et al.[27]	21 Healthy elderly (9 men, age 64 ± 5 years)	ECG monitoring for heart rate variability analysis, finger photoplethysmography for BP assessment	High load (at 80% of 1-RM) until muscular failure vs. low load (at 30% of 1-RM) until muscular failure, and a control session	Low load strength exercise prompted higher systolic and mainly diastolic BP increments in many sets. The heart rate and cardiac output increase and total peripheral resistance reduction following exercise were not different among strength training protocols
Gløvaag et al. [28]	13 Healthy men (age 25 ± 4 years)	Non-invasive beat-to-beat systolic and diastolic blood pressure was measured on the finger, while non-invasive cardiac output was assessed beat to beat by impedance cardiography	4-RM vs. 20-RM leg extensions without breath holding	Exercise systolic/diastolic BP were higher during 20-RM (203 ± 33/126 ± 19 mmHg) vs. 4-RM (154 ± 22/99 ± 18 mmHg) ($P < 0.001$). Cardiac output was higher during 20-RM (13.9 ± 2.2 L/min) vs. 4-RM (10.8 ± 2.6 L/min) ($P < 0.01$)

BP: blood pressure; RM: repetition maximum; PCI: percutaneous coronary intervention; CABG: coronary artery bypass grafting.

Table 2. Studies assessing the cardiovascular response to a single session of high versus low-intensity strength training.

DOI: (10.1177/2047487319847003)

מה עדיף ?

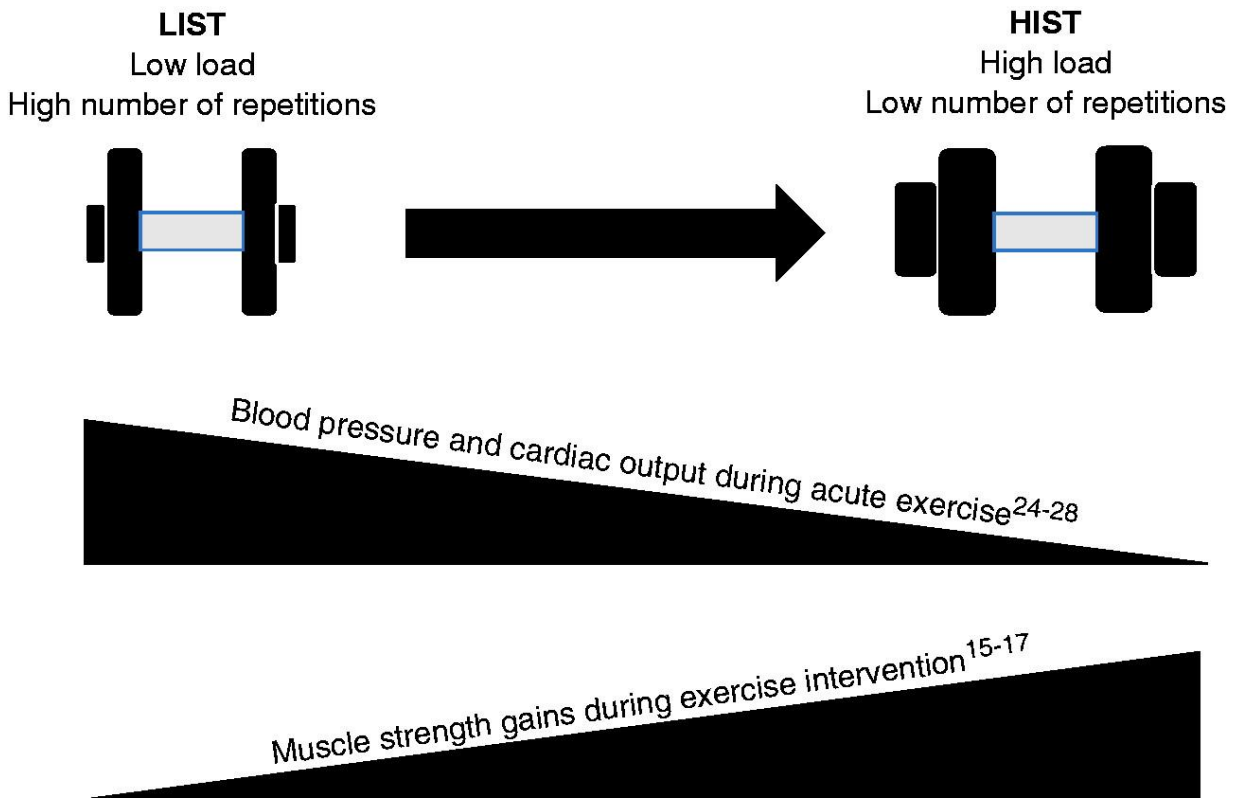


Figure 2. High versus low-intensity strength training in cardiovascular disease: expected acute and chronic physiological effects based on the current literature. LIST: low-intensity strength training; HIST: high-intensity strength training.

DOI: (10.1177/2047487319847003)

Circulation

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

Table 1. Potential Advantages and Disadvantages of HBCR Compared With CBCR

Potential Advantages	Potential Disadvantages
Reduced enrollment delays	Lack of reimbursement
Expanded capacity/access	Less intensive exercise training
Individually tailored programs	Less social support
Flexible, convenient scheduling	Less patient accountability
Minimal travel/transportation barriers	Lack of published standards for HBCR
Greater privacy while receiving CR services	Less face-to-face monitoring and communication
Integration with regular home routine	Safety concerns for patients at higher risk

גם שיקום לב ביתי צריך לכלול את אותם המרכיבים

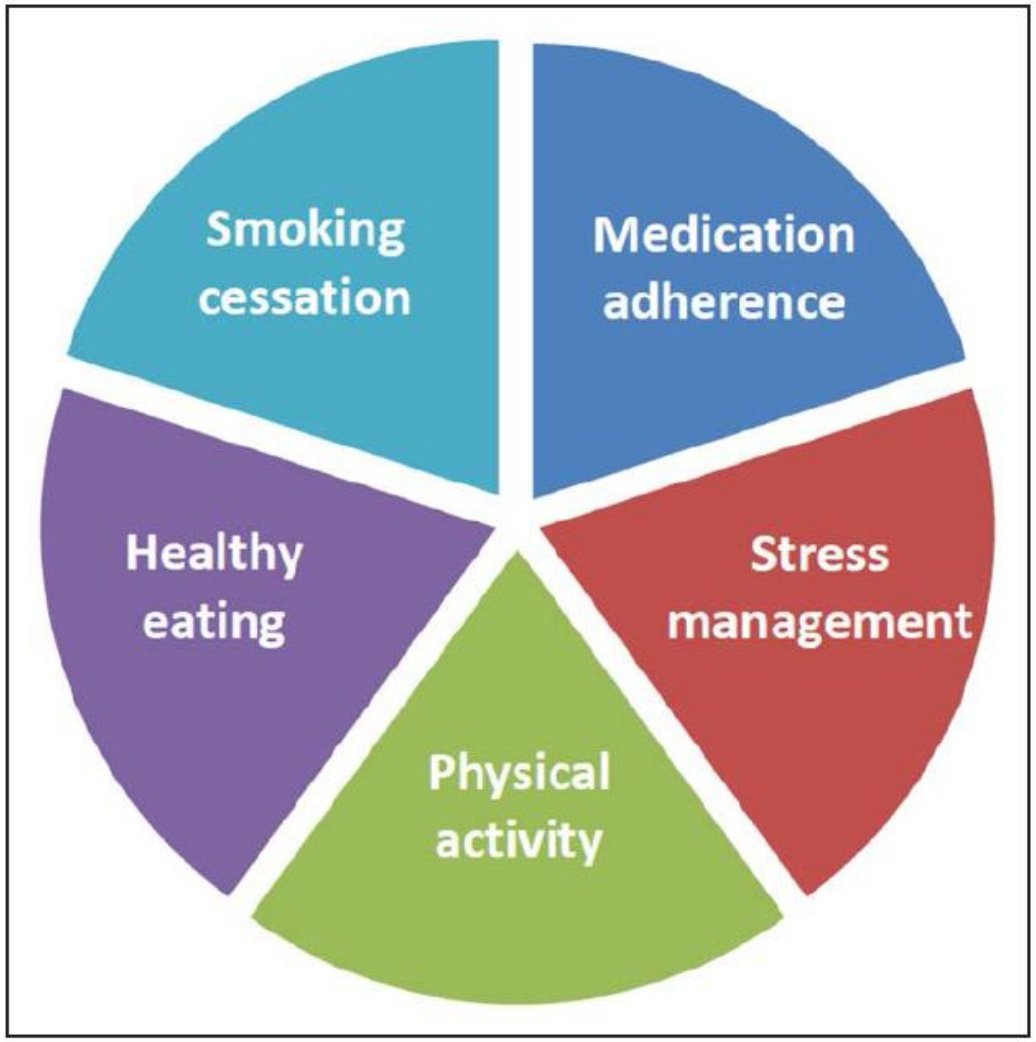


Figure 1. Target health behaviors for cardiac rehabilitation.

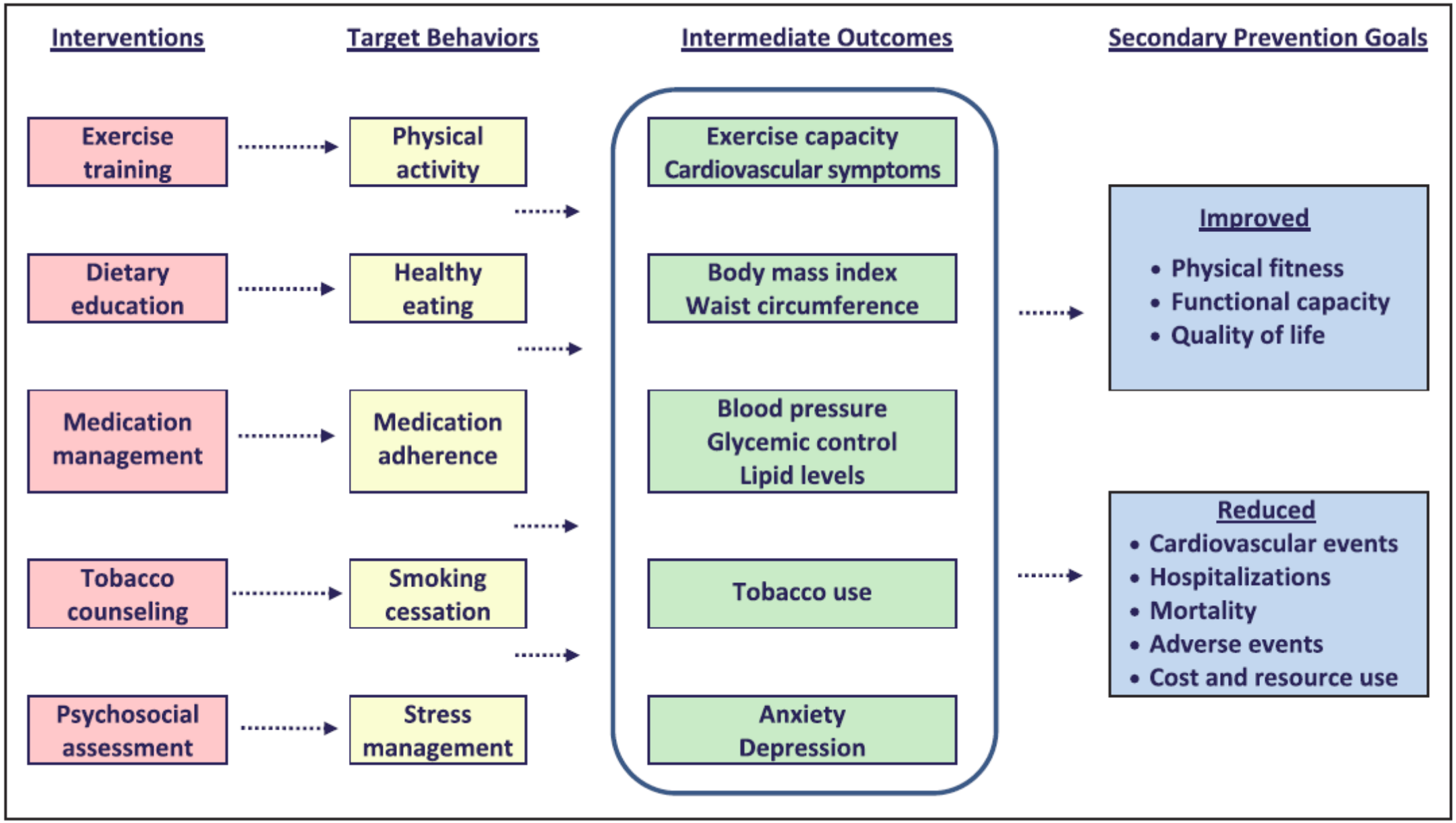


Figure 2. Structure, process, and outcome metrics for home-based cardiac rehabilitation.

Table 2. Twelve Strategies to Facilitate Increased Referral to, Enrollment in, and Long-Term Participation in CR Programs

1. Achieve strong endorsement of outpatient CR by referring physicians and hospital administration by incorporating it into the hospital discharge plan
2. Automatically refer all eligible patients to outpatient CR at the time of hospital discharge
3. Use hospital-based liaisons to provide CR information and education to inpatients before discharge
4. Develop a brief (5–10 min) promotional video about the value of outpatient CR that can be shown to all inpatients during hospital convalescence
5. Provide patients with contact information for outpatient CR programs in close proximity to their home
6. Schedule CR enrollment appointments via the patient's preferred communication mode (telephone call, text message, email, or regular mail)
7. Provide the option of an HBCR program at the time of hospital discharge for low- to moderate-risk patients
8. Consider system-, provider-, and patient-level financial incentives for referral to, enrollment in, and completion of early outpatient exercise-based CR sessions
9. Target specific patient subsets least likely to enroll in and complete CR (eg, racial/ethnic minorities, women, older adults, rural residents, and economically disadvantaged individuals) via a network of diversity liaisons
10. Develop a series of integrated practice units, staffed by allied health professionals, that can provide counseling via in-person visits or through web-based and mobile applications, telephonic coaching, handheld computer technologies, or the internet
11. Establish medication dosing and adherence as a quality assurance initiative in CR
12. Offer serial assessments to track ongoing efforts for cardiovascular risk reduction, including physical activity/fitness

Table 3. Selected Electronic Patient Education Resources

Website	Brief Description
https://www.cdc.gov/heartdisease	Written materials and podcasts for reliable health and safety information
https://www.heart.org	Educational materials for engaging patients with interactive tools
https://www.cardiosmart.org	Educational materials, risk calculators, and mobile applications for medication reminders
http://www.aacvpr.org	Educational resources for patients
https://mendedhearts.org	A support organization for cardiac patients
https://www.goredforwomen.org	Patient education in English and Spanish
https://womenheart.org	A support organization for women with heart disease
http://www.pcna.net	Downloadable patient education booklets; education also provided in Spanish
http://www.theheartmanual.com	UK Heart Manual
https://www.henryford.com/services/cardiology/cardiac-rehab/home-based-cardiac-rehabilitation	Patient education across a variety of cardiovascular disease–related topics using audio PDFs
https://www.cardiaccollege.ca	Patient education and a downloadable guide for living with cardiovascular disease
https://www.heartfoundation.org.au	My Heart, My Life

TECHNOLOGY TOOLS AND HBCR

- לשימוש בטכנולוגיות יש פוטנציאל להרחיב את השיקום הביתי
- להגביר את מעורבות החולה.
- להגביר את הקשר בין החולה למטפל
- ניטור טוב יותר של החולה
- יכולים לשפר את ההענות ואת הדבקות של החולה בשיקום

שיקום לב מרחוק

NEJM Catalyst

About Thought Leaders Events Insights Council Join

Leadership Patient Engagement Care Redesign New Marketplace

Care Redesign

Saving Lives with Virtual Cardiac Rehabilitation

Case Study · August 28, 2019

Tadashi Funahashi, MD, Lina Borgo, MPH & Nina Joshi

Health Innovation Studio, Kaiser Permanente Southern California Medical Group

KAISER PERMANENTE®

SAMSUNG

שיקום לב מרחוק

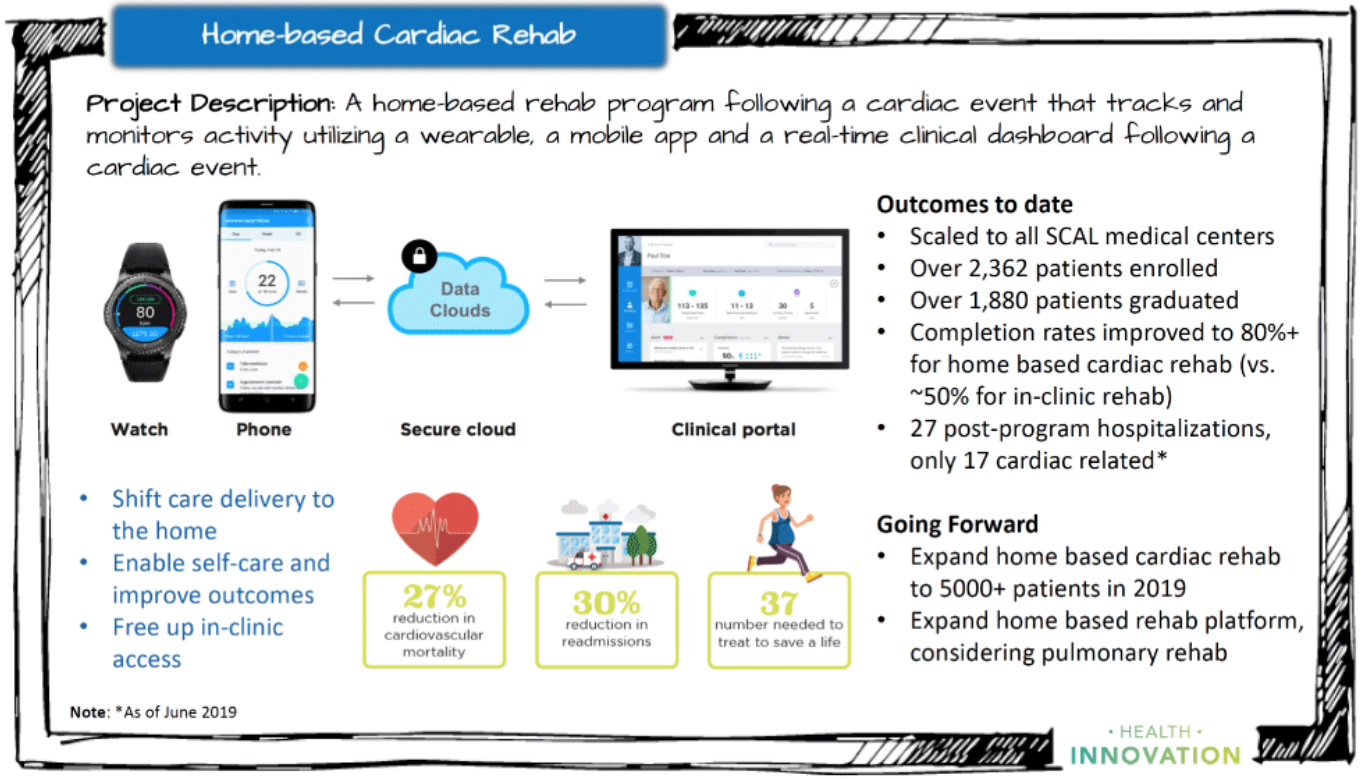
Value of Cardiac Rehab

Interventions	NNT	Lives saved per 1000 patients
Anti-platelets	153	
ACE inhibitors	108	
Statins	94	
Beta blockers	42	
Cardiac rehab	37	

Sources: Created by Kaiser Permanente using the following sources. For anti-platelets, statins, beta blockers: HT Ong, "Beta Blockers in hypertension and cardiovascular disease", BMJ 2007. For ACE inhibitors: HT Ong, "Angiotensin-Converting Enzyme Inhibitors (ACEIs)...: A Meta-Analysis of 10 Randomised Placebo-Controlled Trials", ISRN Cardiology, 2013.

עקרונות ההפעלה והתוצאות

Home-Based Cardiac Rehab: An Overview



Source: Kaiser Permanente

NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society


Thank you!
המרכז הרפואי האוניברסיטאי סורוקה