

The ABCS of Secondary Prevention of Cardiovascular Disease in Montana: The Cardiac Rehabilitation Program

Introduction

Cardiovascular disease (CVD), which includes heart attack and stroke, is the leading cause of death in the nation as well as Montana and accounts for nearly 1 of every 3 deaths.¹ In Montana, more than 2,500 people die from CVD each year.² Because of the high prevalence and the personal and economic costs related to CVD, considerable efforts have been initiated to address CVD prevention.

Million Hearts[®] is an ambitious national initiative to prevent 1 million heart attacks and strokes in the United States by 2017.³ The U.S. Department of Health and Human Services launched Million Hearts[®] in 2011. The Centers for Disease Control and

Prevention and the Centers for Medicare and Medicaid Services serve as co-leaders for the initiative. Many federal, state and private-sector organizations, including the Montana Cardiovascular Health (CVH) Program, have made Million Hearts[®] a priority and are implementing strategies to prevent heart attack and stroke. Such strategies include secondary prevention – trying to prevent heart attack and stroke from happening again in those who have had a documented event.

Key strategies related to Million Hearts[®] involve encouraging healthy lifestyle choices such as preventing tobacco use and limiting sodium and trans fat consumption. The acronym “ABCS” is used to identify key preventive actions as well as to focus on powerful risk factors for cardiovascular disease (Table 1).

The Montana Department of Public Health and Human Services CVH Program has been working diligently on Million Hearts[®] for the past year. Activities have involved working with Community Health Centers, clinics, work sites and hospitals. One project involves working with outpatient

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Table 1. Million Hearts[®] ABCS.

A	Appropriate use of aspirin
B	Blood pressure (BP) control
C	Cholesterol management
S	Smoking cessation

cardiac rehabilitation (CR) programs involved in the Montana Outcomes Project. CR is a supervised exercise and education program that is considered the standard of care and a Class 1 A recommendation for patients recovering from a cardiac event.⁴ Cardiac patients who have completed CR have a 25-45% reduction in morbidity and mortality compared to patients that did not attend CR.^{5,6} A major goal of CR is secondary prevention and much attention is focused on lifestyle interventions targeting risk factors for CVD.

There are currently 21 CR programs in Montana and four in northern Wyoming participating in the Outcomes Project. These programs are members of the Montana Association of Cardiovascular and Pulmonary Rehabilitation (MACVPR). The CR programs submit standardized, de-identified outcomes data to the CVH Program quarterly for analysis. Each quarter and annually, the CVH Program develops benchmarks for each outcome indicator and provides feedback to each CR program. The feedback compares each CR program's individual outcomes data against the region-wide benchmark. This information can then be used to focus quality improvement activities with the goal of improving patient care.

Key ABCS outcome indicators include the percentage of patients taking aspirin or other antiplatelet/anticoagulant medications, the percentage of patients whose BP is <140/90 mmHg (or <130/80 mmHg for patients with diabetes), the percentage of patients with a low-density lipoprotein (LDL) of <100mg/dL,

Table 2. Demographic and diagnostic characteristics among patients at participating MACVPR sites, Montana and northern Wyoming, October 2011—September 2012.

Characteristics	Total (N = 1070)
	Mean (SD)
Age (years)	67.0 (11.3)
Sex	% (n)
Male	71 (762)
Female	29 (308)
Race	
White	97 (1037)
American Indian	2 (18)
Diabetes	18 (190)
Diagnosis	
MI only	5 (57)
MI/CABG	5 (59)
MI/PCI	24 (261)
CABG only	24 (253)
PCI only	22 (237)
Angina	7 (72)
Valve replacement/repair	18 (194)
Heart Failure	6 (62)
Other	7 (76)

and the change in smoking rates pre- to post-program. The Outcomes Project also tracks indicators that parallel the ABCS, including the percentage of smokers referred to cessation programs such as the Montana Quit Line (1-800-QUIT-NOW), the percentage of patients taking lipid lowering medications, dietary fat intake pre- to post-CR, and the average dietary sodium consumption at program entry and at program completion.

Results

More than 1,000 patients were seen at participating MACVPR CR facilities from October 2011 through September 2012. Approximately 70% of the patients were male, 97% were white, with an average age of 67 years. Over 50% of the patients had a diagnosis involving a surgical procedure (coronary artery bypass graft [CABG] or percutaneous coronary intervention [PCI]) alone or in combination with a myocardial infarction (MI) (Table 2).

From program entry to completion of CR, data show a slight decrease in systolic (SBP) and diastolic blood pressure (DBP), a 25% decrease in reported dietary fat intake, a decrease of almost eight percentage points in reported smoking, and an average dietary sodium reduction of 600 mg/day among patients (Table 3).

Ninety-seven percent of CR patients, with no

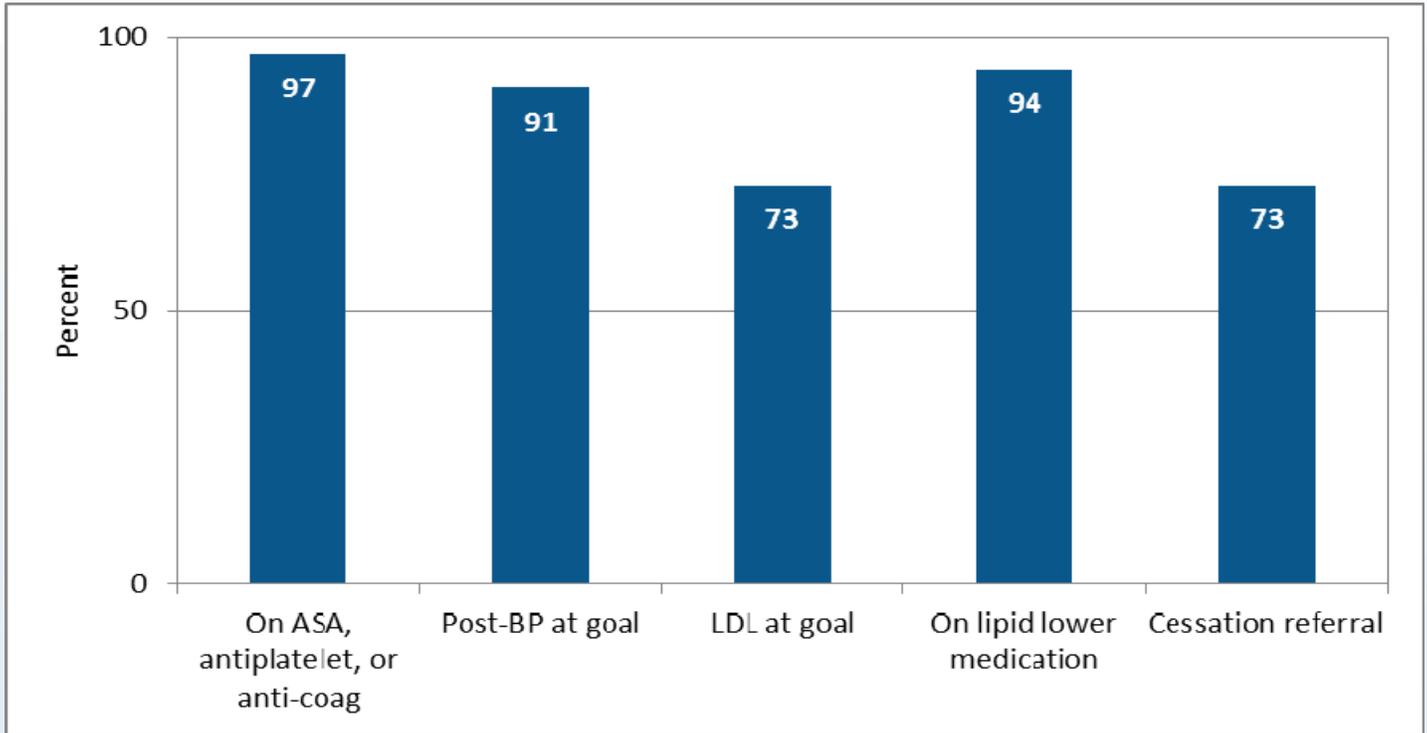
Table 3. Behavioral and clinical domain indicator pre- and post-means among CR patients in participating MACVPR sites, Montana and northern Wyoming, October 2011—September 2012.

Indicator	Pre	Post
Behavioral		
Dietary fat score	19.8	14.7
Smoking status (% smoking)	12.3	4.0
	Mean	Mean
Dietary sodium intake (mg/day)	2682.6	2087.0
Clinical		
Systolic blood pressure (mmHg)	120.1	117.7
Diastolic blood pressure (mmHg)	68.6	67.5

contraindications for aspirin, were on an aspirin, anti-platelet or anti-coagulation medication.

Among patients with no contraindications, 94% were reported being on a lipid lowering medication. In addition, over 90% of CR patients attained BP goal while almost three-quarters achieved LDL goal (<100mg/dL) at completion of CR. Seventy-three percent of pre-program smokers were referred to smoking cessation (Figure 1).

Figure 1. CR indicators from clinical and behavioral domains for participating MACVPR sites, Montana and northern Wyoming, October 2011—September 2012.



Discussion

Cardiac rehabilitation provides an appropriate setting for reinforcing strategies for secondary prevention of a heart attack, which aligns with the Million Hearts® initiative. Patients are typically seen 2-3 times per week and on average complete 25 visits. During the exercise sessions, BP and ECG are monitored and participants receive education counseling. Formal education classes are also part of the CR curriculum and stress secondary preven-

tion. Topics include healthy heart eating, exercise, medication compliance, stress reduction and smoking cessation. This is important to the long-term health of post-cardiac event patients and benefits the referring providers, who may not have time to cover these important topics during office visits.

CR also offers a surveillance system that provides important information to referring providers. Patients are continuously monitored by CR staff during exercise so that potential problems can be identified in a controlled environment. For

example, if a patient's BP is elevated, CR staff can relay this information back to the referring provider and medication adjustments can be incorporated and evaluated over time. CR staff provides regular progress reports to the referring provider highlighting areas that may need to be addressed either acutely or during the next scheduled office visit.

These data suggest patients exiting CR are well positioned to prevent a secondary cardiac event. Post-CR, aspirin usage and BP control were high. Nearly 3 out of 4 patients had an LDL of <100 mg/dL, and the use of lipid lowering medications occurred appropriately (according to standards of care) in nearly all patients. Smoking rates fell from 12% at the beginning of CR to 4% post-CR, and smoking cessation referral was documented in 73% of smokers. Dietary behavior, which can impact blood pressure and cholesterol control, also improved post-CR. For example, dietary fat intake decreased 20% and dietary sodium intake decreased 22% (from 2,682 mg/day at the beginning of CR to 2,087 mg/day at the end of CR).

Conclusion

Cardiac Rehabilitation programming emphasizes key Million Hearts[®] prevention strategies and offers continuing feedback to providers on their patients' cardiac event recovery. This feedback can help ensure delivery of prevention services

that reduce risk of future cardiac events. Health-care providers throughout Montana can play an essential role in the Million Hearts[®] initiative by treating high blood pressure and cholesterol, encouraging aspirin usage for secondary prevention, coaching patients on heart-healthy habits, and addressing barriers to medication adherence. To learn more information about the Million Hearts[®] initiative, please visit: <http://millionhearts.hhs.gov/index.html>. For more information on the CR programs in Montana, please visit: <http://www.macvprmontana.com/>.

References

- ¹Roger VL, Go AS, Lloyd-Jones DM, et al. [Heart disease and stroke statistics—2012 update: a report from the American Heart Association](#). *Circulation*. 2012;125(1):e2–220.
- ²Montana Vital Statistics 2011. Montana Department of Public Health and Human Services, Public Health and Safety Division. On-line publication: <http://www.dphhs.mt.gov/statisticalinformation/vitalstats/index.shtml>.
- ³CDC. [Million Hearts: strategies to reduce the prevalence of leading cardiovascular disease risk factors](#). United States, 2011. *MMWR* 2011;60(36):1248–51.
- ⁴Fihn SD, Gardin JM, Abrams J, et al. [2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS Guideline for the Diagnosis and Management of Patients With Stable Ischemic Heart Disease](#). *Circulation*. 2012;126:e354–e471.
- ⁵Goel K, Lennon RJ, Tilbury RT, et al. [Impact of Cardiac Rehabilitation on Mortality and Cardiovascular Events After Percutaneous Coronary Intervention in the Community](#). *Circulation*. 2011 May 31;123(21):2344–52.
- ⁶Suaya, JA, Stason WB, Ades PA, et al. [Cardiac rehabilitation and survival in older coronary patients](#). *J Am Coll Cardiol*. 54:25–33, 2009.

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use of Aspirin



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Control



Cholesterol
Management



Smoking
Cessation

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