

ORIGINAL RESEARCH & CONTRIBUTIONS

Implementation Study—Vohs National Quality Award

Community Implementation and Translation of Kaiser Permanente's Cardiovascular Disease Risk-Reduction Strategy

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Abstract

Introduction: Since 2003, Kaiser Permanente (KP) has implemented innovative cardiovascular disease (CVD) risk-reduction clinical practices in Northern and Southern California that emphasize the use of cardioprotective medications— aspirin, angiotensin-converting enzyme inhibitors, and statins—in individuals at very high risk of experiencing heart attacks and strokes. Because an internal KP retrospective analysis demonstrated decreased morbidity and mortality among KP patients with diabetes, there is significant value in implementing this strategy in the broader community population, particularly in safety-net clinics serving the uninsured.

Methods: To implement this risk-reduction clinical practice in the community, clinical and programmatic sections of KP had to connect with a set of community partners that share a similar approach of evidence-based prevention. Successful implementation required a well-planned and coordinated collaboration between KP and the community entities that allowed for and supported adaptation in local delivery structures.

Results: Forty-six ambulatory clinic sites based at community health centers and in public hospital/health systems in California's safety net have initiated KP's CVD risk-reduction program. This resulted in 1125 community-clinic patients in Southern California and 1120 patients in Northern California receiving their first prescription for at least 1 of the 3 cardiovascular medications within the first 18 months of implementation. KP Colorado, KP Georgia, and KP Northwest are also implementing these strategies in their local communities.

Discussion: The results of program initiation demonstrate successful translation of the KP CVD risk-reduction strategy to the broader, non-KP member community: uptake of 46 community clinic sites in 2 KP Regions, with a projection of >11,000 patients being prescribed the 3 cardioprotective medications in subsequent years and in multiple Regions. This may be a model for further spread of CVD prevention measures, and prevention programs for other diseases, to all populations throughout the US, notably underserved communities disproportionately affected by chronic conditions.

Introduction

Cardiovascular disease (CVD) is the leading cause of death and disability in the US¹ and in the world.² A reduction in CVD of up to 80% has been projected for individuals at high risk for CVD who take cardioprotective medications,³ and prospective modeling⁴ predicted that the use of three cardioprotective medications (angiotensin-converting enzyme [ACE] inhibitors, aspirin, and statins) in high-risk individuals would be expected to reduce the number of myocardial infarctions (MIs)

and strokes by 71% after five years of therapy with these medications.⁵ Nonetheless, despite this evidence supporting the benefit of a large-scale, population-based, risk-reduction medication program, the use of these medications in the larger community remains low. In 2004, <50% of people with diabetes achieved treatment goals and took appropriate cardioprotective medications.⁶ If the use of these medications increased by 10% in people with diabetes in the US, up to 32,000 MIs and strokes each year would be prevented.⁷

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Kaiser Permanente (KP) has successfully implemented CVD risk-reduction programs across its eight Regions with positive outcomes for patients at high risk for CVD; an internal review demonstrated a reduction of >60% in heart attacks and strokes after one year among Northern and Southern California KP patients with diabetes who took ACE inhibitors and statins.⁵ A study of 46,000 Northern California patients demonstrated that the number of MIs declined by 24% since 2000 and that the relative incidence of serious infarctions doing permanent damage declined by 62%.⁸ To achieve a broader and deeper population impact, CVD-prevention programs must be implemented in a variety of different delivery settings. In particular, populations with a disproportionate burden of diabetes and CVD should be targeted. Previous studies of large community-based CVD-prevention programs have not demonstrated significant decreases in cardiovascular morbidity and mortality.⁹ In this article, we demonstrate that two KP Regions, Northern California and Southern California, were able to successfully initiate a cardiovascular risk-reduction program in partnership with health care delivery organizations serving the broader community.

Kaiser Permanente's Community Benefit Mission

At the core of the history and mission of KP is the organization's commitment to improving the health of its patients and the communities it serves. The most evident manifestation of this commitment is the practice of good medicine: providing health care that is of high quality, affordable, and readily available to purchasers, including employers, individuals, and government programs. Demonstrating superior clinical outcomes that are patient-centered, and doing this in a way that is acutely sensitive to affordability, is a hallmark of KP's contribution to the greater good and safeguards its role as the largest private, nonprofit health care delivery organization in the country. Beyond that, KP has a long legacy of extending its influence to create healthy environments for the communities it serves, including programs that promote health and wellness among school-age children; investing in community efforts to combat pediatric obesity; developing a diverse workforce that emphasizes primary and community practice; and modeling responsible practices that respect and preserve the environment.

Another key component of KP's community benefit mission is to improve health care quality and access to the most vulnerable members of the community.

Recognizing that KP members are part of families and neighborhoods where as many as one of every six people are uninsured, KP has dedicated resources, technical assistance, and investments to fortify the institutions that care for the medically indigent. This spirit of partnership recognizes that health care-delivery organizations must actively collaborate to achieve optimal health for everyone in a community, whether they are insured or not.

The Safety Net

Community health centers and public hospitals, often referred to collectively as the safety net, are critical partners in establishing successful health care practices and interventions that ultimately take hold across an entire geographic region. Particularly in the face of stubborn health care disparities that lead to disproportionate morbidity and mortality among members of low-income racial and ethnic minorities, these organizations are vital in demonstrating viable solutions for attaining a higher standard of clinical quality across a community.

KP has identified safety-net partners as critical to the establishment of evidence-based community practice.¹⁰ This was the basis for KP to pursue safety-net partnerships to establish a simplified pharmacologic CVD-prevention effort that would have much more far-reaching implications than if conducted solely as an internal KP member initiative.

Methods

Collaboration Between Kaiser Permanente Entities and Community Partners

The importation of KP's CVD-prevention program required the coordination of a number of individuals and organizational units. One unique aspect of this effort was harnessing the expertise of groups within KP that had a limited history of mutual joint program coordination. Moreover, this coordination within KP had to result in a coherent package of assistance to community-based partners. The key stakeholders included the following:

- *Clinical experts:* The Care Management Institute (CMI)—a department supported jointly by the Kaiser Foundation Health Plan and The Permanente Federation—has been an incubator of evidence-based CVD-prevention activities for KP's eight Regions. Over several years, CMI cultivated experience with internal spread of a KP CVD-prevention strategy focused on the use of cardioprotective medications. To ensure a sound underlying clinical premise of community spread, validated by internal KP practice,

CMI's physician leader for diabetes care was retained for consultation to the national Community Benefit office and worked closely with the Medical Director of Community Benefit. The Northern California KP regional physician leader for cardiovascular care provided additional insight into regional implementation and practice. Thus, key clinical leads worked directly with the Medical Director at Community Benefit to ensure physician engagement in shared effective approaches to measuring and monitoring spread and to integration of clinical practice with program design.

- *KP clinicians and staff:* Additionally, it was important to involve experienced program managers at specific KP facilities and medical offices. These nurses, physicians, and managers of chronic disease provided first-hand accounts of overcoming clinician resistance and skepticism about the three-drug therapy to audiences and key leaders at community health centers. They provided authentic testaments to successful implementation of this program. The Permanente Medical Group and the Southern California Permanente Medical Group (SCPMG) were early endorsers of the implementation of a broad community program to improve adoption of the cardiovascular medication protocol.
- *Community Benefit:* Concurrently, the resources of KP's Community Benefit program were aligned to support the spread of KP's CVD risk-reduction strategy into the community. Like many other operations at KP, Community Benefit is organized in successive units of geographic and service levels to facilitate movement from concept and resource allocation to execution.

Thus, the Community Benefit Department at the national Program Office worked closely with both the Northern and Southern California community benefit divisions to develop a plan that would leverage grant making against established, robust partnerships in the community, particularly among community health centers. Not only were grant dollars identified and secured for investment to launch this initiative, but also there was an assessment of community partners to determine their requisite interest, experience, and track record of deploying disease-management strategies. These relationships were assessed both at the regional and local (county) levels.

- *Safety-net partners:* In California, several years of quality-improvement work characterized KP's partnership with the safety net. Indeed, a memorandum of understanding (KP—Regional Association of Clin-

ics Community Clinic Partnership, Adopted 2009 Jan 22) between regional consortia of community health centers, and the California Primary Care Association had been in place and provided the framework for shared learning in population management and quality improvement. Thus, there was already a significant compendium of experience regarding the applicability of KP practices in chronic-care management in the community health center environment. Likewise, many of the community health centers had been involved in the federally supported Chronic Care Improvement Program, so there was residual familiarity and experience with population management strategies. California's public hospitals had similar experience with prior initiatives supported by the California Health Care Safety Net Institute (www.safetynetinstitute.org/content), foundation philanthropies, and KP.

Implementation with Northern California and Southern California Community Partners

Skepticism abounds across the US health care system regarding transfer of successful practices to other organizations. Many believe that successful practices are inherently bounded by their own organization's parameters and culture, and that translation of successful practices inevitably gets buried in the slog of organization inertia. One critical strategy for the translation of the KP CVD risk-reduction program was to strip implementation to its barest, most essential components. In this case of community translation, the central focus was the simplified delivery of three cardioprotective drugs, with less focus on titration and laboratory monitoring. From this core principle, community partners could use tools, teams, and approaches that were unique to their own systems. Northern and Southern California provided funding, technical assistance, and other support to help expand the program into the community.

The Southern California Region focused on identifying an appropriate pilot organization and selected the Community Clinics Health Network in San Diego to launch this program. Along with its member clinics, the network was a participant in the Health Resources and Service Administration's National Health Disparities Collaborative, which focuses on providing care for the diabetes population. In addition, the San Diego Community Clinic Consortia demonstrated success through Community Health Improvement Partners' San Diego Diabetes Coalition. Southern California Region Community Benefit also administered grants to

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Riverside County Regional Medical Center (RCRMC), the Pasadena Public Health Department, and the Los Angeles County Department of Health Services. One specific example of local implementation was partnering RCRMC with a physician-champion from SCPMG for presentations to key physicians and clinicians in launching the program in 2008. As of December 31, 2009, the RCRMC program had enrolled 2207 patients who now benefit from the cardiovascular medication protocol.

The Northern California Region chose to work with community clinic consortia and public hospitals with geographic proximity to ensure that wherever patients entered the safety-net health system in that area, they could access KP's CVD-prevention program. For example, staff members of the Northern California Region's Community Benefit collaborated with senior staff at Community Health Center Network, a community clinic consortium that includes eight community clinics throughout Alameda County. Together, they reviewed clinics that were the most ready to pilot program translation and implementation. Readiness included experience with patient registries to identify and monitor patients at high risk for CVD, clinic leadership, and physician, clinician, and staff interest in participating in the project.

For both the Northern and Southern California programs, key elements included identifying and engaging dedicated KP clinical champions to serve as resources; providing a wide variety of KP training and technical assistance and, in some cases, as in Southern California, providing training and technical assistance from other grantees. Technical assistance included presentations by KP champions to clinic providers; site visits to KP facilities to learn about management of patient panels, protocols, and procedures; discussions with local program champions; informative lectures; transfer of successful practices, forms, and templates; patient-education material; and practical advice on patient tracking, clinical engagement, and follow-up care.

Participants also attended statewide grantee meetings, cohosted by KP Northern and Southern California Regions. Grantees who were initial participants became peer educators to other grantees regarding KP's CVD-prevention program, the translation of the program to their community medical sites, and the sustainability of the processes. In Northern California, for example, clinics developed care-management teams for the evidence-based program, adapted in-reach and outreach techniques for recruiting and monitoring patients, and developed data-collection tools and feedback systems

for translating the program to and implementing it in their unique community settings.

Although both California Regions provided tools and resources to help with translation and implementation, community partners developed an infrastructure to ensure successful implementation. Changes to a database and to data-management systems were the modifications most often employed for implementing KP's program. Other changes included developing messages to be sent to patients to encourage regular medication use, creating procedures for identifying patients, and modifying existing clinic physician and staff responsibilities to include health coaching and management of patient panels.

Results

The impact of implementing KP's CVD risk-reduction strategy in the community, focusing on the use of the cardioprotective medications, was assessed in several ways:

1. *Clinical impact on community patients:* The number of individuals given a prescription for aspirin, an ACE inhibitor, and a statin and who continued to take the medications was the primary metric used to evaluate successful implementation. An independent 2008 evaluation by the Center for Community Health and Evaluation (CCHE) of the efforts to implement the CVD risk-reduction program in California safety-net settings determined that—using conservative projections—1125 patients in Southern California and 1120 patients in Northern California were given their first prescriptions for the three medications. As of May 2010, 46 ambulatory clinic sites based at community health centers and in public hospital/health systems in California's safety net have initiated KP's CVD risk-reduction program. Successful implementation in the California community sites has catalyzed adoption among an increasing number of safety-net institutions across the US.
2. *KP regional site implementation:* After an initial planning stage in 2008, KP Colorado Community Benefit, in partnership with Colorado Permanente Medical Group, is now in active program implementation and translation with Clinica Campesina, a community health center serving a large Latino and homeless patient population. KP Georgia Community Benefit, in partnership with Georgia Permanente Medical Group, has worked with DeKalb County Board of Health since 2008 and is in the program implementation phase at a community clinic staffed by physician volunteers. KP Northwest awarded a grant in 2009

to a local Native American clinic in Portland, OR, to implement the program.

3. *Patient and clinician satisfaction:* The 2008 CCHE report also assessed patient and clinician satisfaction. Clinicians reported that patients were:

- Very satisfied with the program
- Finding the extra support regarding compliance with medication regimens and lifestyle changes helpful
- Developing closer relationships to clinic staff
- Receiving more supportive care.

Clinicians were also enthusiastic about their enhanced roles in implementing a population management program and its positive impact on overall care delivery. Comments included this one:

“[KP’s CVD risk-reduction program] helped us to refocus our efforts on our chronic disease care. Also on quality improvement culture in general—clinic flow, and operations. It has created a better awareness of quality improvement. Our pharmacy assistance program has become a focus more now too—to help patients get their meds—in part because of the greater focus on patients getting their medications.”

KP’s CVD risk-reduction model has been so successful with some grantees’ populations of patients with diabetes that the grantees have used this for translation for other chronic conditions:

“We started doing this with other patients, not just cardiovascular and diabetes patients. So we’d use the action plan for asthmatics and other groups.”

Most significant is the benefit to a target population with disproportionate prevalence of disease among ethnic and racial groups and the persistence of suboptimal clinical outcomes among underserved populations. In addition, the “place” where the practice establishes itself has deep impact; in this case, that was among community-based institutions whose mission is to care for the medically indigent. A standard-setting medical practice in these settings can lead to catalytic transformation of clinical care well beyond the clinics themselves.

Discussion

The results of program initiation demonstrated successful translation of KP’s CVD risk-reduction strategy to the community: uptake of 46 community clinic sites in multiple Regions, with a projection of >11,000 patients being prescribed the three cardioprotective medications in subsequent years.

Historically, large-scale programs that address a wide spectrum of CVD risk factors have failed to demonstrate significant impact. However, KP has successfully implemented a medication-focused CVD-prevention program that significantly reduced CVD events.^{5,8} Given the opportunity for an even larger population impact coupled with the KP Community Benefit mission, KP chose to disseminate this program into the safety net, which has several features similar to the KP integrated model—a focus on evidence-based medicine and prevention, a broad and community-based approach, and systemization of care delivery.

The observational analysis of this project has limitations related to generalization of results. The shared philosophy and approach between KP and the safety net about clinical care may be a unique predictor of success for this particular successful translation of clinical practice. However, responses gathered from the CCHE assessment, along with both a commitment to evidence-based practice and flexibility of implementation, suggest core elements for successful execution across different delivery systems. The particular role of KP grant making to initiate safety-net implementation may have factored into successful execution. Not only would the monetary investment but also the particular relationship between grant maker and recipient have to be considered. Finally, we do not have proof of sustainability or data validating a reduction in CVD outcomes. We will collect and report those data as they become available. As detailed in the “Methods” section, changing clinical practice for the benefit of broad, community-based patient outcomes requires complex multi-entity, multistructural, multiprocess, and multiperson change and integration–transformation. This is the foundational intervention described in this article, with the additional result that thousands of underserved patients are now receiving clinical treatment through a CVD-prevention program.

In summary, a program for CVD risk reduction, including a focus on a simple trio of medications and measurement of their use, along with other optional aspects, was translated from KP to select community programs by using the local site’s existing structure, function, and staff. Successful implementation in the safety net required a deliberate and well-planned collaboration between KP and a set of community partners that maintains central principles of evidence-based implementation but accounts for adaptation of local delivery structures.

This may be a model for further spread for CVD prevention, and other disease-prevention programs,

Successful implementation in the California community sites has catalyzed adoption among an increasing number of safety-net institutions across the US.

throughout various patient populations within the US, including the underserved. If the three cardioprotective medications were taken by all of the individuals in the US at high risk for CVD, there would be a profound impact on the cost and morbidity associated with potentially preventable CVD. According to a recent analysis, if an additional 10% of US patients with diabetes began taking and continued to take the bundled triad of cardioprotective medications, 32,000 MIs and strokes each year would be prevented.⁷ ❖

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

Acknowledgments

The authors would like to thank Michael Cox, Mercy Siordia, Karen Koh for their contributions to this manuscript.

Katharine O'Moore-Klopf, ELS, of KOK Edit provided editorial assistance.

References

1. FastStats: leading causes of death. [homepage on the Internet]. Atlanta, GA: Centers for Disease Control and Prevention; © 2009 [cited 2010 Apr 26]. Available from: www.cdc.gov/nchs/fastats/lcod.htm.
2. Media Center: The top ten causes of death [fact sheet on the Internet]. Geneva, Switzerland: World Health Organization; © 2010 [cited 2010 Apr 26]. Available from: www.who.int/mediacentre/factsheets/fs310/en/index.html.
3. Wald NJ, Law MR. A strategy to reduce cardiovascular disease by more than 80%. *BMJ* 2003 Jun 28;326(7404):1419. Erratum in: *BMJ* 2006 Sep;60(9):823; *BMJ* 2003 Sep 13;327(7415):586.
4. Eddy DM, Schlessinger L. Archimedes: a trial-validated model of diabetes. *Diabetes Care* 2003 Nov;26(11):3093–101.
5. Dudl RJ, Wang MC, Wong M, Bellows J. Preventing myocardial infarction and stroke with a simplified bundle of cardioprotective medications *Am J Manag Care* 2009 Oct 1;15(10):e88–94.
6. Saydah SH, Fradkin J, Cowie CC. Poor control of risk factors for vascular disease among adults with previously diagnosed diabetes. *JAMA* 2004 Jan 21;291(3):335–42.
7. Archimedes case study: Cost-effective analysis [monograph on the Internet]. San Francisco, CA: Archimedes; © 2010 [cited 2010 Apr 26]. Available from: <http://archimedesmodel.com/case-studies.html>.
8. Yeh RW, Sidney S, Chandra M, Sorel M, Selby JV, Go AS. Population trends in the incidence and outcomes of acute myocardial infarction. *N Engl J Med* 2010 Jun 10;362(23):2155–65.
9. Sorensen G, Emmons K, Hunt MK, Johnston D. Implications of the results of community intervention trials. *Annu Rev Public Health* 1998;19:379–416.
10. Wong WF. KP evidence-based medicine in the community. *Perm J* 2005 Spring;9(2):81–2.

Suggested Readings

- Collaborative overview of randomised trials of antiplatelet therapy—I. Prevention of death, myocardial infarction, and stroke by prolonged antiplatelet therapy in various categories of patients. Antiplatelet Trialists' Collaboration. *BMJ* 1994 Jan 8;308(6921):81–106.
- Center for Community Health and Evaluation. Kaiser Permanente's ALL/PHASE initiative in the safety net: experiences from community clinics and public hospital and health systems in California. 2009 Mar. Available from: http://info.kp.org/communitybenefit/assets/pdf/about_us/global/KP_ALLPHASE_SN_FINAL.pdf.
- Collins R, Armitage J, Parish S, Sleight P, Peto R; Heart Protection Study Collaborative Group. MRC/BHF Heart Protection Study of cholesterol-lowering with simvastatin in 5963 people with diabetes: a randomised placebo-controlled trial. *Lancet* 2003 Jun 14;361(9374):2005–16.
- Dougherty D, Conway PH. The "3T's" road map to transform US health care: the "how" of high-quality care. *JAMA* 2008 May 21;299(19):2319–21.
- Gaede P, Vedel P, Parving HH, Pedersen O. Intensified multifactorial intervention in patients with type 2 diabetes mellitus and microalbuminuria: the Steno type 2 randomised study. *Lancet* 1999 Feb 20;353(9153):617–22.
- Effects of ramipril on cardiovascular and microvascular outcomes in people with diabetes mellitus: results of the HOPE study and MICRO-HOPE substudy. Heart Outcomes Prevention Evaluation Study Investigators. *Lancet* 2000 Jan 22;355(9200):253–9.
- Heart Protection Study Collaborative Group. MRC/BHF Heart Protection Study of cholesterol lowering with simvastatin in 20,536 high-risk individuals: a randomised placebo-controlled trial. *Lancet* 2002 Jul 6;360(9326):7–22.
- Institute of Medicine, Committee on Health Care in America. Crossing the quality chasm: a new health system for the 21st Century. Washington (DC): National Academy Press; 2001. Available from: www.nap.edu/books/0309072808/html/.
- Woolf SH. The meaning of translational research and why it matters. *JAMA* 2008 Jan 9;299(2):211–3.