Preface:

Larry A. Green

**Prescription for Health: Round 1 Initial Results**
Ann Fam Med 2005 3: S2-S3.

Cross-Project Analyses:

- Maribel Cifuentes, Douglas H. Fernald, Larry A. Green, Linda J. Niebauer, Benjamin F. Crabtree, Kurt C. Stange, and Susan B. Hassmiller
  **Prescription for Health: Changing Primary Care Practice to Foster Healthy Behaviors**
  Ann Fam Med 2005 3: S4-S11.

- Deborah J. Cohen, Alfred F. Tallia, Benjamin F. Crabtree, and Denise M. Young
  **Implementing Health Behavior Change in Primary Care: Lessons From Prescription for Health**

- Steven H. Woolf, Russell E. Glasgow, Alex Krist, Claudia Bartz, Susan A. Flocke, Jodi Summers Holtrop, Stephen F. Rothemich, and Ellen R. Wald
  **Putting It Together: Finding Success in Behavior Change Through Integration of Services**

- Thomas Bodenheimer, Denise M. Young, Kate MacGregor, and Jodi Summers Holtrop
  **Practice-Based Research in Primary Care: Facilitator of, or Barrier to, Practice Improvement?**
Lessons Learned from Practice-Based Network Innovators:

Alan M. Adelman and Marie Graybill

Integrating a Health Coach into Primary Care: Reflections From the Penn State Ambulatory Research Network

Laura Anderko, Claudia Bartz, and Sally Lundeen

Wellness for a Lifetime: Improving Lifestyle Behaviors of Low-Income, ethnically Diverse Populations

Adolfo J. Ariza, Robert S. Greenberg, Susan A. LeBailly, Helen J. Binns, and For The Pediatric Practice Research Group

Parent Perspectives on Messages to Be Delivered After Nutritional Assessment in Pediatric Primary Care Practice

Kate MacGregor, Sharon Wong, Claire Sharifi, Margaret Handley, and Thomas Bodenheimer

The Action Plan Project: Discussing Behavior Change in the Primary Care Visit

Myra A. Crawford, T. Michael Harrington, Toya V. Russell, Frank A. Franklin, Christopher D. Lorish, Tamela J. Turner, and Brenda K. Baumann

Practice Extenders and PDA-Based Counseling for Smoking and Unhealthy Diet

Paul Dassow, David Hoke, Kimberly Ann Moore, and M. Ann Williamson

Bringing the Behavioral Health Improvement Program (BeHIP) to Rural Kentucky

Ellen R. Wald, Linda Ewing, Patricia Cluss, Sheri Goldstrohm, Lynne Cipriani, and Kathleen Colborn

Establishing a Family-Based Intervention for Overweight Children in Pediatric Practice
Ann Fam Med 2005 3: S45-S47.

Alex H. Krist, Steven H. Woolf, Stephen F. Rothemich, Robert E. Johnson, and Diane B. Wilson

It Takes a Partnership: The Value of Collaboration in Developing and Promoting a Web Site for Primary Care Patients
Steven A. Dosh, Jodi Summers Holtrop, Trissa Torres, Anita K. Arnold, Jeanne Baumann, and Linda L. White

*Changing Organizational Constructs Into Functional Tools: An Assessment of the 5 A’s in Primary Care Practices*

Javán Quintela, Deborah S. Main, Wilson D. Pace, Elizabeth W. Staton, and Kirsten Black

*LEAP—A Brief Intervention to Improve Activity and Diet: A Report From CaReNet and HPRN*

Lisa E. Gordon and Susan A. Flocke

*Mutual Learning and the Transformation of Study Intervention Tools*

Kevin A. Peterson, Tai Mendenhall, Sharon Allen, Helen Roemhild, Pamela Werb, Mark Janowiec, Richard Botelho For the Minnesota Academy of Family Physicians Research Network (MAFPRN)

*Minnesota Clinicians Motivating Health Improvement (MINIT) Study: Motivating Healthy Habits*

Bonnie McRee, Jennifer Granger, Thomas Babor, Ingrid Feder, Audie Horn, Jr, Judith Steinberg, and Keith vom Eigen

*Reducing Tobacco Use and Risky Drinking in Underserved Populations: The Need for Better Implementation Models*

Sandra Puczynski, Kevin Phelps, Allan Wilke, Rollin Nagel, Daniel Hickey, Dalynn Badenhop, Frank Repka, and Wendy Boone

*Collaborative Goal Setting to Improve Lifestyle Behaviors: Lessons Learned From NOPCRN*

Ardis L. Olson, Cecelia A. Gaffney, Viking A. Hedberg, Wendy Gladstone, Sam Dugan, Robert Mathes, and Paul Reiss

*The Healthy Teen Project: Tools to Enhance Adolescent Health Counseling*

Steven W. Heim, Mohan Nadkarni, Lisa K. Rollins, John B. Schorling, David B. Waters, Fern R. Hauck, and Scott M. Strayer

*Modular Lifestyle Intervention Tool: A Handheld Tool to Assist Clinicians in Providing Patient-Tailored Counseling*

**Acknowledgments**
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Our genetic endowment, social circumstances, environmental conditions, and health care are recognized to be important determinants of health, but our behavior is estimated to have a larger impact than any of these. Indeed, the choices we make about using tobacco and alcohol, physical activity, and diet are powerful, changeable contributors to suffering needlessly and dying prematurely.\textsuperscript{1,2}

There is widespread acknowledgment that the health care that is delivered in the United States is not the health care that could and should be delivered.\textsuperscript{3,4} All primary care medical specialties have called for serious revisions in the delivery of primary care,\textsuperscript{5-8} and the nation now enjoys the largest, best-trained primary care workforce in its history, comprised of nurses, physician assistants, general internists, general pediatricians, and family physicians.\textsuperscript{9} A medical home for everyone is envisioned that provides a reliable basket of services for people of all ages, regardless of their clinical concerns.\textsuperscript{10} Within this set of services are health assessment, disease prevention, health promotion, patient education, support for self-care, primary mental health care, advocacy for patients to get the services they need, and integration of services across the health care spectrum.\textsuperscript{5} These are the services necessary to promote and sustain healthy behaviors.

Meanwhile, the nation continues to spend more and more for health care services\textsuperscript{11} while failing to achieve top performance and falling behind other industrialized nations in terms of population health measures.\textsuperscript{12,13} Fortunately there has been substantial progress in planning for redesigned health care, and there is keen ongoing interest in redesigning primary care practice for unprecedented performance.\textsuperscript{10} Accompanying these developments in primary care and medicine, the science of behavior change has matured.\textsuperscript{14-16} To this mix has been added a new kind of research laboratory—the primary care practice-based research network (PBRN).\textsuperscript{17} Numerous local and regional as well as a few national networks now exist, having demonstrated their capacity to ask and answer important questions at medicine's front lines.\textsuperscript{18}

Thus, a vibrant mix of opportunity, knowledge, resources, and challenge exists, inviting immediate action to insert into the “DNA” of new models of primary care effective services needed to enhance the health of the nation through the promotion of healthy behaviors by individuals. The Robert Wood Johnson Foundation, the Agency for Healthcare Research and Quality, and the nation’s practice-based research networks united in a program named Prescription for Health\textsuperscript{19} to step up and make a difference. The basic idea is to move onto the largest single platform of health care delivery, the offices of primary care clinicians,\textsuperscript{20,21} to discover what it actually takes to help individuals make and sustain healthier choices.

This supplement verifies keen interest and responsiveness of frontline clinicians to this challenge and reports initial results from a first round of funding that enabled primary care clinicians in PBRNs to formulate and test some of their best, practical ideas about how to help people avoid and change unhealthy behaviors and adopt and maintain healthier choices. The central purpose of this first round of work was to demonstrate the feasibility of strategies in real primary care practices.

An overarching evaluation was embedded in Prescription for Health from its beginning, reaching into and across each network's strategies. With time, this evaluation, in collaboration with the networks, is making sense of innovations that enable lifestyle changes.

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in primary care practice. Insights are emerging about what it takes, what conditions are necessary for achieving meaningful improvements, and promising practices discovered and employed by the networks.

Progress to date points toward necessary further work and the need for more comprehensive strategies, exactly the target of the next round of funding by Prescription for Health. This further work will push toward patient-oriented measures and comparisons of effectiveness across networks that may identify achievable options for widespread dissemination.

For those looking for ideal, proven strategies ready for immediate implementation in primary care practices, this supplement will prove disappointing. However, for those seeking evidence of feasibility of promising options for routine daily medical practice, this supplement is likely to be an encouraging resource. In addition to the insights and lessons compiled into this supplement, there are multiple other reports from the Prescription for Health practice-based research networks in press in various journals. By assembling this synopsis of experience from the first round of funding, it is hoped that further partnerships and efforts can be enabled to keep advancing toward the routine adoption into frontline primary care practices of strategies that work efficiently and are capable of enhancing the health status of the nation.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S2.

Key words: Practice-based research network; health behavior

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Prescription for Health: Changing Primary Care Practice to Foster Healthy Behaviors

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ABSTRACT

PURPOSE The leading causes of premature death in the United States are linked to 4 behaviors: smoking, unhealthy diet, physical inactivity, and risky alcohol use. We report lessons from 17 exploratory projects funded under Prescription for Health that tested the feasibility of innovative behavior change strategies for at least 2 of these behaviors in primary care practices.

METHODS Seventeen practice-based research networks (PBRNs) implemented and evaluated tools, cues, and techniques in 120 family medicine, internal medicine, pediatric, and nursing practices across an ethnically diverse sample of adults, children, and adolescents in rural and urban settings. We reviewed progress reports and notes from site visits and 3 meetings to generate overarching lessons.

RESULTS PBRNs successfully implemented their projects in diverse practices despite reported logistical challenges and practice constraints. The networks showed that distributing the effort across the care team and throughout the practice and community is possible. Although each behavior required specific attention, each did not require its own separate staff and system. Three models emerged as helpful guides for the comprehensive redesign of health behavior counseling, but they require adaptation for use in real-world primary care settings. Traditional methods of collaboration yielded mixed results, making obvious a need for dedicated collaboration funds and a better framework to identify and align high-yield opportunities.

CONCLUSIONS These projects confirm the feasibility of health behavior counseling in primary care practice. They also highlight the need for substantive practice redesign, and the value of models and frameworks to guide redesign and collaborative efforts.

INTRODUCTION

The most common causes of disease, disability, premature death, and health care burden in the United States can be directly attributed to 4 health risk behaviors: smoking tobacco, risky use of alcohol, unhealthy diet, and physical inactivity. An estimated 77% of adults are inactive, 58% are overweight, 23% smoke, and 11% engage in risky drinking. Consistent evidence indicates that these behavioral risk factors present in clusters in individuals and populations, and although considerable progress has been made to address these behaviors one at a time, large gaps remain in the delivery of proven single-behavior interventions and in the development of effective strategies for addressing these multiple behaviors simultaneously. Parallel to these urgent problems is a failing health care system that falls short of providing the type of health care that people need, want, and deserve.

In the United States more people see primary care clinicians than any other part of the health care system. These clinicians confront practice conditions wherein patients' immediate needs demand attention, and they often lack the time, skills, resources, practical tools, and reimbursement systems to counsel patients toward sustainable health behavior change.

The call to redesign health care overall and primary care in particular...
stresses patient-centered, integrated care across clinical practice, the community, and the health care system. A new model of primary care practice requires comprehensive redesign to meet a full range of patient needs, including health behavior counseling. This new model of practice requires multidisciplinary care teams, shared decision making, access to services beyond clinic walls, and electronic information systems designed to support clinicians and patients.

A series of studies conducted by the Center for the Advancement of Health found that even in the absence of an integrated health care system, great opportunity to influence personal health choices exists untapped in the nation’s primary care offices. Millions of people identify these primary care clinicians as their usual source of care, value their advice, and are motivated to act on that advice.

Recognizing that primary care practices could have considerable impact on health-related behaviors, the Robert Wood Johnson Foundation (RWJF) organized a national invitational meeting of practice-based research network (PBRN) leaders, practicing clinicians, practice staff members, and community partners, along with leading researchers in health behavior change; chronic illness care, and practice change. This conference engaged the perspectives of the potential participants to inform the design of a new research initiative and identified the potential of community-practice partnerships and the need to reconcile idealized models of health promotion and the realities of most practices.

Prescription for Health: Promoting Healthy Behaviors in Primary Care Research Networks is a national RWJF initiative that unites these developments into a $9 million, 5-year program. The program aims to identify, test, and evaluate practical, evidence-based tools, cues, and techniques to improve the delivery and effectiveness of health behavior change strategies in routine primary care practice. It focuses on 4 leading health risk behaviors associated with premature death: smoking tobacco, risky drinking, unhealthy diet, and physical inactivity. In its first phase of funding (Round 1), Prescription for Health funded 17 exploratory projects that tested the feasibility of incorporating innovative behavior change strategies in primary care practices. In this article, we report findings from Round 1, which began in July 2003 and concluded in October 2004.

The goal of Round 1 was to explore whether and how a variety of innovative approaches could feasibly be installed into the existing organizational structure of primary care practices. Seventeen family medicine, internal medicine, pediatric, and nursing PBRNs from across the nation (Figure 1) were funded to carry out exploratory projects for at least 2 of the 4 target behaviors. Projects focused on the feasibility of tools, cues, and techniques for improving the delivery and reach of health behavior counseling in routine primary care practice. Rather than prescribe specific types of projects, the program invited PBRNs to imagine what innovations were achievable in current practice conditions. The 17 PBRNs received modest grants of $125,000 each and worked within an aggressive 16-month time frame to implement their projects. The networks were not required to report patient outcomes in this first round. Instead, RWJF funded an independent analysis team (A-Team) to analyze project proposals, field notes of site visits, program meeting notes, project interviews, and network entries posted to online diaries to identify characteristics that support successful implementation and adherence to behavior change interventions in the primary care setting.

Instead of addressing 1 behavior at a time, strategies funded by Prescription for Health addressed multiple behaviors. Six of the 17 projects addressed all 4 target behaviors, 1 project addressed 3 behaviors, and 10 projects addressed 2 behaviors (Table 1). Projects were implemented in a total of 120 family medicine, internal medicine, pediatric, and nursing practices across an ethnically diverse sample of adults, adolescents, and children in rural and urban settings. These practices included solo and group practices, Federally Qualified Health Centers, and community nursing centers. Table 1 summarizes the projects as proposed.

METHODS

The National Program Office, which serves as the program’s headquarters, reviewed 3 data sources. Reports from 8 site visits, each lasting 2 days, to selected PBRNs included an assessment of their political support, analytical approach, operations, and research capacity, and an analysis of their strengths, weaknesses, opportunities, and threats. Midpoint (8-month) progress reports included accomplishments to date, preliminary results, major challenges encountered, and possible opportunities for further research. Semifinal (15-month) progress reports included a description of the final project, which in many instances was modified from what was initially proposed, preliminary findings, and overarching lessons. Notes from 3 face-to-face national meetings with the 17 PBRNs included common experiences reported by representatives from the PBRN research teams about project implementation challenges and strategies to address them, issues related to different models and frameworks guiding the design of their projects, potential synergies among projects, and ideas to foster their collaboration.

Iterative discussions of these 3 data sets with the A-Team, consultants, national advisory board members,
and RWJF staff were used to generate 4 overarching, initiative-wide lessons from Round 1.

RESULTS
Lessons Learned
We learned 4 lessons from our analyses of data from Round 1 of Prescription for Health.

Lesson 1: Health Behavior Counseling Can Be Done in Frontline Primary Care Practice
Clinicians, practice staff, and patients were receptive to the tools, cues, and techniques that were tested in Prescription for Health. The single greatest challenge reported by the PBRNs was the logistics of project implementation in practices with different cultural, geographic, staffing, and ownership configurations. PBRNs developed a myriad of innovative solutions to address these challenges including (1) revising patient recruitment strategies to address seasonal concerns, such as summer physical examinations and influenza; (2) developing effective reminder systems, such as medical record flags, prescription pads, posters, and electronic reminders to continuously prompt practices to use available resources; (3) using teleconferencing and videoconferencing to provide regular reinforcement, training, and assistance to practices spread throughout the PBRNs; (4) identifying techniques to cope with altered work flow, such as strategic use of front desk personnel, medical assistants, and nurses to conduct health risk assessment and, in some instances, part or all of the patient counseling; (5) restructuring the configuration of check-in counters and waiting areas to accommodate the innovations being tested, and (6) forming partnerships with community groups by engaging opinion leaders, attending community meetings, and actively seeking opportunities to create linkages with community resources, such as local walking clubs, fitness centers, support groups, and other community agencies, to optimize available resources to patients outside the office.

Despite logistical barriers, all 17 networks succeeded in implementing the proposed strategies in different locations in the practice and in the community (summarized in Table 1), verifying that it is challenging but possible to install these types of strategies in busy primary care practices to improve health behavior counseling.

Lesson 2: Increased Health Behavior Counseling in Primary Care Requires Substantive Practice Redesign
As networks tested their practice innovations, they identified practice constraints that complicated implementation. Such constraints included (1) the lack of established communication systems for staff members, such as regular practice meetings; (2) multiple ways to use and maintain medical records, ranging from 100% paper to a combination of paper and electronic to full electronic medical records; (3) different ways to identify, track, and follow up with patients who have risk behaviors, such as random notations in medical records, patient registries for specific diseases, and paper and electronic reminders at well-patient visits; (4) diverse roles that practice staff play in patient behavior change, ranging from completely physician-centered to nurse- and physician-centered to involving the entire practice staff; (5) different uses of patient resources, ranging from paper handouts to community resource Web sites to formal referral to dietitians, fitness experts, and telephone or group counseling; and (6) ineffective reimbursement and incentive systems to cover the cost of behavior counseling.

In spite of these obstacles, Round 1 experience showed that distributing the effort across a care team and beyond the examination room is possible. Care to patients who are modifying their behavior can be delivered in and outside of the examination room (eg, at reception desks or weigh-in stations, in conference
Table 1. Characteristics of Prescription for Health Projects

<table>
<thead>
<tr>
<th>PBRN</th>
<th>Behaviors Addressed</th>
<th>Target Population</th>
<th>Activation Point</th>
<th>Tools</th>
<th>Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama Practice Based Research Network (APBRN)</td>
<td>Diet, tobacco</td>
<td>Adult</td>
<td>Clinician</td>
<td>PDA, health advisor/coach</td>
<td>5 A’s, motivational interviewing, goal setting/action plan, community links, e-mail follow-up</td>
</tr>
<tr>
<td>Clinicians Enhancing Child Health (CECH)</td>
<td>Activity, diet, tobacco, drinking</td>
<td>Adolescent (12-18 years)</td>
<td>Clinician, patient</td>
<td>PDA, health advisor/coach, educational materials, patient assessment/screen</td>
<td>5 A’s, motivational interviewing, goal setting/action plan, community links, e-mail follow-up, clinician training</td>
</tr>
<tr>
<td>Colorado Research Network (CReNNet), High Plains Research Network (HPRN)</td>
<td>Activity, diet</td>
<td>Adult</td>
<td>Clinician, staff, patient</td>
<td>Pedometer, patient assessment/screen, activity/nutrition logs, prescription pad</td>
<td>Clinician/staff modelling of behavior change, goal setting/action plan, telephone follow-up</td>
</tr>
<tr>
<td>Dartmouth-Northern New England COOP Project</td>
<td>Activity, diet, tobacco, drinking</td>
<td>Adult</td>
<td>Patient, practice, health plan, community</td>
<td>Web site, registry, patient assessment/screen, vital signs</td>
<td>5 A’s, goal setting/action plan, community links, group visits, telephone follow-up, e-mail follow-up, motivational interviewing</td>
</tr>
<tr>
<td>Great Lakes Research Into Practice Network (GRIN)</td>
<td>Activity, diet, tobacco, drinking</td>
<td>Adult</td>
<td>Practice, nurse-consultant</td>
<td>Practice assessment, consultant</td>
<td>5 A’s, practice consultation, goal setting/action plan</td>
</tr>
<tr>
<td>Kentucky Ambulatory Network (KAN)</td>
<td>Activity, tobacco</td>
<td>Adult</td>
<td>Patient</td>
<td>Prescription pad, health advisor/coach, activity/nutrition logs, educational materials, patient assessment/screen</td>
<td>Community program, goal setting/action plan, telephone follow-up</td>
</tr>
<tr>
<td>Midwest Nursing Centers Consortium Research Network (MNCCRN)</td>
<td>Activity, diet</td>
<td>Adult</td>
<td>Clinician, patient</td>
<td>Pedometer, nutrition/activity logs, health advisor/coach, patient assessment/screen</td>
<td>Group visits, goal setting/action plan, community links, telephone follow-up</td>
</tr>
<tr>
<td>Minnesota Academy of Family Physicians Research Network (MAFFPRN)</td>
<td>Activity, diet, tobacco, drinking</td>
<td>Adult</td>
<td>Patient, staff</td>
<td>Web site, health advisor/coach, educational materials, vital signs, patient assessment/screen</td>
<td>Motivational interviewing, community links, telephone follow-up, e-mail follow-up, clinician training, external personnel</td>
</tr>
<tr>
<td>New England Clinicians Forum (NECF)</td>
<td>Tobacco, drinking</td>
<td>Adult</td>
<td>Clinician, staff</td>
<td>Health advisor/coach, educational materials, vital signs, patient assessment/screen</td>
<td>Brief intervention, scheduled follow-up visit, clinician training</td>
</tr>
<tr>
<td>Northwestern Ohio Primary Care Research Network (NOPCRN)</td>
<td>Activity, diet</td>
<td>Adult</td>
<td>Clinician, patient</td>
<td>PDA, pedometer, activity/nutrition logs, patient assessment/screen</td>
<td>Goal setting/action plan, telephone follow-up, clinician training</td>
</tr>
<tr>
<td>Pediatric PitNet</td>
<td>Activity, diet</td>
<td>Children (8-12 years)</td>
<td>Clinician, staff, parent</td>
<td>BMI chart, health advisor/coach, vital signs, educational materials, activity/nutrition logs, patient assessment/screen</td>
<td>Motivational interviewing, community links, goal setting/action plan, group visits, clinician training</td>
</tr>
<tr>
<td>Pediatric Practice Research Group (PPRG)</td>
<td>Activity, diet</td>
<td>Children (2-10 years)</td>
<td>Practice, patient, parent</td>
<td>PDA, wall chart, educational materials, vital signs, patient assessment/screen, practice assessment</td>
<td>Practice consultation, clinician training</td>
</tr>
<tr>
<td>Penn State Ambulatory Research Network (PSARN)</td>
<td>Activity, diet</td>
<td>Adult</td>
<td>Staff, patient</td>
<td>Health advisor/coach, registry, educational materials, patient assessment/screen</td>
<td>Motivational interviewing, goal setting/action plan, community links, telephone follow-up, e-mail follow-up, external personnel</td>
</tr>
<tr>
<td>Research Association of Practices (RAP)</td>
<td>Activity, diet, tobacco, drinking</td>
<td>Adult</td>
<td>Clinician, staff, patient</td>
<td>Web site, prescription pad, educational materials, patient assessment/screen, practice assessment</td>
<td>Motivational interviewing, community links</td>
</tr>
<tr>
<td>Virginia Ambulatory Care Outcomes Research Network (ACORN)</td>
<td>Activity, diet, tobacco, drinking</td>
<td>Adult</td>
<td>Clinician, patient</td>
<td>Web site, patient assessment/screen, educational materials</td>
<td>Community links</td>
</tr>
<tr>
<td>Virginia Practice Support and Research Network (VaPSRN)</td>
<td>Diet, tobacco</td>
<td>Adult and adolescent</td>
<td>Clinician</td>
<td>PDA, vital signs, patient assessment/screen, practice assessment</td>
<td>Motivational interviewing</td>
</tr>
<tr>
<td>UCSF/Stanford Collaborative Research Network (CRN)</td>
<td>Activity, diet, tobacco</td>
<td>Adult</td>
<td>Clinician</td>
<td>Patient assessment/screen</td>
<td>Goal setting/action plan, clinician training, external personnel</td>
</tr>
</tbody>
</table>

PBRN = practice-based research network; PDA = personal digital assistant (ie, handheld computers); 5 A’s = ask, advise, agree, assist, arrange; BMI = body mass index; UCSF = University of California at San Francisco.
rooms), at home and at work (telephone counseling, Web-based information), and in the communities where people live (gyms, parks, walking clubs) as illustrated in Figure 2. Integrating innovations, such as personal digital assistant (PDA) screening tools linked with community behavioral counseling resources, or readiness-to-change assessments linked with a health coach, cannot occur without redesigned work flow, roles, and systems, however.

The importance of integrated systems of care for behavior change is further elaborated on by Woolf et al in this supplement. A separate staff and system are not required for every disease and every risk behavior. The adaptive approaches taken in Prescription for Health show promise for addressing multiple risk behaviors in persons with various diseases, possibly creating efficiencies that could enhance the affordability of health behavior counseling in primary care.

Lesson 3: Refinement of Existing Models and Frameworks Based on Frontline Experience Can Guide the Incorporation of Behavior Counseling Into Primary Care Practice

Three specific models were particularly helpful guides for the comprehensive redesign of practice to incorporate health behavior counseling: the Chronic Care Model, Rogers’ model of the diffusion of innovations, and the 5 A’s model.

In designing interventions around multiple risk behaviors, the PBRNs considered factors beyond a single behavior or intervention point (Figure 2). They were not required to organize their work around any particular model, but the Chronic Care Model (CCM) was suggested in the call for proposals as a viable framework. All the tools, cues, and techniques proposed by the PBRNs mapped to the 6 domains of the CCM as shown in Table 2. Although many of the PBRNs had portions of projects that mapped to pieces of the CCM, most did not explicitly propose a more comprehensive approach to redesigning care. The CCM could be a useful framework for considering more comprehensively how new tools, cues, and techniques for health behavior counseling fit across all the dimensions of care. This model also suggests that the dimensions of comprehensive health behavior counseling substantially overlap and align with current thinking about how practices should approach caring for people with chronic diseases. It is therefore plausible that primary care practices could redesign their work to address both chronic care and health behavior counseling, resulting in improvements for both.

A second model, Rogers’ model of the diffusion of innovations, is...
innovations, acknowledges that innovation is difficult and a good idea alone is not enough. Innovation requires tailoring, revision, and adaptability, along with perseverance and leadership to surmount resistance and foster commitment to new ways of thinking. Most PBRNs found it was necessary to tailor and adapt their interventions midstream to accommodate unanticipated practice needs. These modifications manifested as extended timelines (eg, 15 of 17 PBRNs requested extensions to complete their projects), additional training for practice staff on use of new technology or counseling techniques (eg, PDAs, motivational interviewing, group visits), and changes to data collection strategies (eg, synching data from PDA to a central server). PBRNs recruited physicians, nurses, and other practice staff as practice champions to provide leadership and foster implementation and evaluation for these pilot studies.

The PBRNs recognized that health behavior counseling extends beyond a single patient visit. A third model, the 5 A’s model, identifies 5 components (ask, advise, agree, assist, and arrange) that can be sequenced to help patients address unhealthy behaviors. Several PBRNs used this model to focus their strategies, define boundaries, and create links inside and outside the practice. One project conducted the ask and agree functions in the practice and used a statewide smoking quit line that was prescribed in the examination room to fulfill the advise function and guide patients toward assistance. Another project used a health coach who was linked to the practice to guide patients through the entire counseling sequence, while yet another project conducted the ask function as an additional vital sign, performed the advise, agree, and assist functions through the use of an action plan, and incorporated arrange into a follow-up visit.

These emerging insights point not only to the usefulness of these models and frameworks, but also to the need to adapt and modify them based on the local experiences of those using them within the complexities of real-world settings.

Lesson 4: Coevolution, Rather Than Traditional Collaboration, Can Be a Useful Framework for Creating Synergies Across Projects

In Round 1, the National Program Office used traditional collaboration methods such as e-mail listservs, Web sites, online discussion groups, and face-to-face meetings, with mixed results. The challenges with this approach included the long distances between PBRNs, the independent nature of grantees, the numerous competing demands faced by the research teams, and the lack of time, incentives, and financial resources to fund the additional costs of collaboration. It became clear that a dedicated pool of money and a better framework were necessary to foster high-yield collaborative opportunities and better align the incentives to the overall

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### Table 2. Strategies Implemented by Prescription for Health Projects by Domain of the Chronic Care Model

<table>
<thead>
<tr>
<th>Domain</th>
<th>Implementation Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community resources</td>
<td>Locally based community health advisors</td>
</tr>
<tr>
<td></td>
<td>Web-based directories of community resources</td>
</tr>
<tr>
<td></td>
<td>Web links to relevant information or resources outside community (regional or national)</td>
</tr>
<tr>
<td>Health care organization</td>
<td>Practicewide assessments</td>
</tr>
<tr>
<td></td>
<td>Clinician assessments (attitudes, satisfaction, readiness to change)</td>
</tr>
<tr>
<td></td>
<td>Evaluation of use of specific tools or techniques</td>
</tr>
<tr>
<td></td>
<td>Negotiated support from insurers for project activities</td>
</tr>
<tr>
<td>Self-management support</td>
<td>Patient-centered goal setting and action plans</td>
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<td>Motivational interviewing techniques</td>
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<td>Physical activity and dietary logs</td>
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<td>Community resource directories</td>
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<td>Local walking club</td>
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<td>Periodic follow-up from health change facilitators, educators, or advisors</td>
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<td>Telephone and e-mail follow-up and support</td>
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<td>Pedometers</td>
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<td>Delivery system design</td>
<td>Tailored behavior change educational materials or information</td>
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<td>Patient questionnaires before visit and ongoing (Web-based)</td>
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<td>Staff role changes and education</td>
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<td>Health advisors, educators, coaches/health change facilitators</td>
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<td>Brief interventions</td>
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<td>Periodic health assessments (vital signs and others)</td>
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<td>Prescription pads for health behaviors</td>
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<td>Group visits</td>
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<td>Telephone and e-mail follow-up support</td>
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<td>Decision support</td>
<td>Patient-reported health behavior information (before, during, and between visits)</td>
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<td>Relevant preventive services guidelines</td>
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<td>Patient readiness-to-change assessments</td>
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<td>Tailored scripts and techniques</td>
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<td>Patient-tailored care recommendations</td>
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<td>Targeted evidence-based recommendations</td>
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<td>Electronic (Web, PDA) decision-support tools</td>
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<td>Clinical information systems</td>
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<td>Reminder systems (electronic, posters, assessments, patient-reported behavior indicators, other)</td>
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<td>Patient-completed screening tools</td>
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<td>Logs and behavioral questionnaires</td>
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<td>Expanded vital signs to include risky health behaviors</td>
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PDA = personal digital assistant (ie, handheld computer).
goals of individual projects and the program. Coevolution provides such a framework.

Coevolution is a biological concept that describes “successive changes among two or more ecologically interdependent but unique species such that their evolutionary trajectories become intertwined over time.”32 Coevolving, as a relational concept, comes from the business literature and asserts that collaboration should not be forced, but rather allowed to flourish naturally and voluntarily. Coevolution therefore sets the conditions for collaboration but allows synergy and competition to emerge from the ground up, rewarding individual accomplishments, not collaboration. This approach allows teams to choose collaborative strategies that are mutually beneficial based on enlightened self-interest and to choose only those that have the potential for highest yield. This framework recognizes that collaboration is time consuming, resource intensive, high risk, and not always productive. Instead of working toward creating as many synergies and webs of relationships as possible, coevolution takes a strategic approach to building the number and types of collaborative links and continually shifting this web of relationships to capture new opportunities and end nonproductive ones. The goal of coevolving teams is to stay agile and flexible to respond to the changing demands of their work and each other.32

Limitations
The limitations of Round 1 included the short time frame along with the modest amount of funding to support these projects. Several PBRNs obtained supplemental funds from their home institutions or other organizational partners to support additional project costs. Although these drawbacks limited more comprehensive work, the program succeeded in testing the projects’ feasibility in current practice conditions, which was the goal of Round 1. The extra burden of innovating and balancing competing demands often resulted in implementation delays, study design changes, practice attrition, and requests for grant extensions. Many projects did not apply a formal organizational change model to guide the incorporation of innovations into practice, which likely contributed to some of the challenges the PBRNs experienced. Unavoidable and desirable variation and tailoring of innovations occurred to facilitate their installment in practices with unique organizational and cultural structures. Diary data that substantiate these limitations are presented by Cohen et al27 in this supplement. Lastly, few projects measured patient outcomes, largely because of insufficient funding and the short time frame of Round 1. The second round of Prescription for Health focuses on patient outcomes and more standardized measurements across projects.

CONCLUSIONS
The redesign of health care that is under way presents primary care with compelling opportunities to help patients choose and sustain healthier behaviors. The first round of experience in Prescription for Health confirms keen interest among the nation’s frontline primary care clinicians, and the willingness and ability to innovate strategies that can be achieved in frontline practice and that align well with recommendations for new model practice.30-23 Progress to date reveals an alignment of approaches useful for addressing health behaviors from a preventive care perspective with that of caring for people with chronic illness. This alignment suggests that in new models of primary care practice, systems created to address primary prevention and chronic care may overlap and create synergies and efficiencies to enable improved prevention and chronic care, possibly avoiding duplication and waste.

Incorporating strategies in primary care practices to change risky behaviors and sustain healthy ones is not easy. Although all the Prescription for Health practices were willing to test the feasibility of incorporating changes into their existing systems, not all were prepared or able to incorporate these changes into their practices as formalized quality improvement measures beyond study completion. This tension is further explained by Bodenheimer et al33 and further substantiated with diary data by Cohen et al27 in this supplement. What is needed next includes the adoption of a quality improvement mind-set by all primary care practices and system reform to sustain these improvements. This need necessarily challenges the status quo, continually looking for better ways to observe, measure, and test small and large changes, even if only informally, and it espouses the belief that all primary care practices can do something now to help their patients be healthier. Such a mind-set must attend to the other important and integrated functions of primary care while working on promoting healthy behaviors.34 Another key step is to conduct further assessment of the impact of multifaceted behavior change strategies on practices and patients that aim to integrate what takes place in the examination room, the practice, and the community where patients actually live out their choices.

Round 1 of Prescription for Health confirms that changing a complex system such as a primary care practice is challenging, and pleads for better understanding of how practice can be changed most effectively to help patients adopt healthier behaviors while understanding important aspects of current practice that need to be maintained. With further research and development in the real-world laboratories of PBRNs, and with policy changes particularly to the financing of primary care, improvements in the delivery of care may
be achieved that affect not a few, but millions of people, reducing avoidable suffering and premature death.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3(Suppl_2)/S4.

Key words: Health behavior change; counseling; health behavior; practice change; primary care redesign; practice-based research network; behavioral/psychosocial; health promotion/disease prevention

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Implementing Health Behavior Change in Primary Care: Lessons From Prescription for Health

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ABSTRACT

PURPOSE Our objective was to identify themes that emerged from the evaluation of 17 interventions funded by the Robert Wood Johnson Foundation’s Prescription for Health that aimed to enhance adherence to healthy behaviors in the primary care setting.

METHODS We performed a content analysis of diary data from this 16-month initiative. Other data sources used to complement this analysis include funded grant applications and field notes from interviews with investigative teams and a limited number of site visits. Participants were 17 practice-based research networks (PBRNs) that had projects funded during Round 1 of Prescription for Health.

RESULTS Five themes emerged regarding implementation of health behavior change: (1) health behavior change resources are enthusiastically received by practices and patients, and when given a choice, patients prefer methods of assistance that involve personal contact; (2) practice extenders require extensive training, as well as careful case management and support, in order to function fully and avoid burnout; (3) integrating behavior change tools into the primary care setting requires time, effort, and often specialized expertise; (4) even simple interventions require practice change, and use of a practice change model to guide implementation efforts is crucial; and (5) research philosophy and project management approaches vary across PBRNs and have implications for the potential sustainability of an intervention.

CONCLUSIONS A more versatile, multifaceted solution involving new tools, technologies, and multidisciplinary care teams is needed in order to integrate health behavior change into everyday primary care routines. Even the best interventions require a model to articulate how to integrate an innovation into practices.


INTRODUCTION

There is widespread acknowledgment that fundamental changes are required in primary care practices to meet the diverse care needs of patients, families, and communities in the United States.1,2 This need for change is particularly evident in targeting lifestyle issues that are the leading causes of morbidity and mortality nationally.3 Although innovative models and practical tools and techniques have been developed to address lifestyle issues in primary care practices, these have not been well disseminated. There is a growing recognition that the ecology of primary care practice is complicated4 and that clinician behavior is relatively resistant to common approaches to change.5,6 To facilitate change in primary care, greater attention to adoption, implementation, and maintenance,7 practice capacity,8,9 and health care system linkages10 is needed.

Prescription for Health: Promoting Healthy Behaviors in Primary Care Research Networks is a national program of the Robert Wood Johnson Foundation (RWJF) in collaboration with the Agency for Healthcare Research and Quality.11
Research and Quality (AHRQ). This program provides 2 rounds of grant funding to primary care practice-based research networks (PBRNs) to develop and pilot-test creative practical strategies for integrating approaches to health behavior change into routine primary care practice. The program targets 4 health risk behaviors that are the nation’s leading causes of preventable disease, disability, and premature death: lack of physical activity, poor diet, tobacco use, and risky use of alcohol.11 This report focuses on Round 1 of the Prescription for Health initiative, which ended October 2004. Round 2 begins in July 2005.

The RWJF established the Prescription for Health Analysis Team (A-Team) to conduct an independent process evaluation of the program. The goals of this evaluation were to understand project and practice characteristics that support the successful implementation of and adherence to healthy behavior interventions in the primary care setting, and to identify new insights and patterns that transcend individual projects. In this article, we describe 5 cross-cutting themes that emerged from our analysis of evaluation data collected during Round 1 of the initiative. These themes underscore the need for approaches to health behavior change in the primary care setting, and they identify the types of resources and capacities necessary to develop and integrate health behavior interventions in this setting.

**METHODS**

**Data Collection**

The A-Team performed a multimethod assessment that included collecting survey data at the PBRN and practice levels, as well conducting interviews and a limited number of site visits with each investigative team (Figure 1). Although these data provided cross-sec-

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**Figure 1. RWJF Prescription for Health evaluation plan.**

- **Filters affecting interventions**
  - Prescription for Health interventions
  - PBRN capacity and characteristics
  - Practice capacity
  - Other practice characteristics
  - Intervention outcomes
    - Practice
    - Clinician
    - Patient

- **Surveys**
  - Grantee data
    - (not available to A-Team)

- **Ongoing and comparative case study analyses**

- **Ongoing feedback to grantees and NPO**
  - Understand context (PBRN and practice)
  - Describe interventions
  - Identify synergies among projects
  - Identify larger patterns among projects
  - Validate quantitative findings
  - Explain why change did or did not occur
  - Provide feedback to NPO and RWJF

RWJF = Robert Wood Johnson Foundation; PBRN = practice-based research network; PIF = Practice Information Form; A-Team = Analysis Team; NPO = National Program Office.
tional PBRN-, practice-, and project-level information that allowed ongoing insight into the implementation process, interactive online project diary "rooms" were created on the AHRQ-sponsored PBRN secure extranet for each of the 17 investigative teams. Project diaries functioned as both a data collection tool, providing additional insight into the implementation process, and as a mechanism for facilitating ongoing 2-way communication between investigative teams and the A-team.

The A-Team conducted a content analysis of all funded grant applications to determine the scope and focus of each project, and to identify potential diary keepers from each investigative team. In June 2003, the team sent a personalized letter to each principal investigator outlining the details of the evaluation and identifying research team members who were potential diary keepers. During a 30-minute telephone call with each investigative team, 3 to 5 people were selected to be diary keepers, at least 1 or 2 of whom would be in close contact with practices during the implementation process. Diary keepers were asked to make an entry twice a month. Questions to help spark the diary-writing process were provided via a help button in each diary room, but in general, diary keepers were asked to write about their project development, recruitment, and implementation experiences. The A-Team regularly posted responses to diary entries to elicit more information or elaboration from a diary keeper.

Two members of the A-Team received e-mail notification each time a new diary entry was posted. One team member read diary entries at the time of receipt, addressed immediate concerns, and copied the entry into a word-processing program to facilitate sharing with A-Team members.

Analyses

Real-Time Process Analysis

The A-Team conducted a real-time process analysis that involved the ongoing iterative process of reading and reflecting on the data as they were collected. During weekly meetings lasting approximately 3 hours, each diary entry was read aloud and discussed. Other data (eg, survey data, notes from interviews and site visits), as well as earlier diary postings, were brought in as needed to fully understand the implementation experiences reported. Decisions were made regarding how to respond to the week’s diary entries, and 1 person posted questions to each diary room. Using data from the project diaries, as well as notes from key interviews and site visits, the A-Team created case descriptions for each project and updated these descriptions regularly as new data were received. Grant applications, diary entries, and field notes taken during the site visit were incorporated into a comprehensive searchable Folio Views database (ver 4.11; Open Market Inc, Burlington, Mass).

Comprehensive Analysis

In April 2004, when many projects were well under way and diary contributions were substantial, the A-Team transitioned into a single case analysis mode in which all available data for a project (eg, diaries, grant applications, interview and site visit notes, and communications, as well as available survey data) were examined in greater detail. This analysis proceeded iteratively and involved an immersion-crystallization approach. First, the A-Team examined data to identify overarching, organizing themes. Subsequently, A-Team members were asked to take the lead on identifying, describing, and articulating project themes via the development of a preliminary report. In September 2004, preliminary summary reports were created and an in-depth cross-case comparison was conducted to identify cross-cutting themes. To accomplish this task, A-Team members read each preliminary report independently, looking for common patterns across projects and working to reach consensus in regard to the key implementation lessons. This process involved reexamining relevant data within and across projects when discrepancies arose, and corresponding with grantees to collect additional data, and to confirm or refute insights or themes, particularly when themes were present in 1 project but absent in others. At the culmination of Round 1, the A-Team prepared a final report for each investigative team that included an analysis and synthesis of the findings.

RESULTS

Fifty-seven grantees were asked to keep online diaries, and 569 diary entries were made. The median number of monthly diary entries made per project team was between 3 and 4. The A-Team conducted site visits with 9 PBRNs and conducted 2 interviews with each investigative team.

Round 1 Prescription for Health projects represent a diverse array of intervention approaches (Table 1). In the sections that follow, we describe the 5 themes that emerged from our analysis of the evaluation data collected from this round of the initiative.

Theme 1: The Need for Health Behavior Change Interventions

Practices and patients enthusiastically respond to interventions that provide an additional health behavior change resource; practices eagerly refer patients to this resource, and patient recruitment is easy, with referrals often exceeding what research teams can offer.
The data suggest that many patients want someone to talk with when undertaking a health behavior change, and when given options, patients choose intervention approaches that facilitate interaction with a counselor or coach rather than those that are self-guided. The following diary entries illustrate these observations.

Practices’ Enthusiasm

They have been very cooperative and are looking forward to the intervention which they think is really needed at their site considering that “we feel unprepared to assess and manage overweight children.” (Project 8, diary entry, 10/24/03)

From the largest to the smallest clinic, the physicians and site coordinators are thrilled to be a part of the study and ask if they can begin recruiting immediately after our visit. In fact, at one clinic the staff wanted to enroll as study participants! (Project 2, diary entry, 1/8/04)

Enthusiasm is running very high. At one site, 7 of 12 signed up for a mini-triathlon—all for the 1st time . . . They put a map on the wall, got some clip art, and the teams are marching across the country—passing each other up. (Project 12, diary entry, 12/24/03)

Patients’ Enthusiasm

The second group met one week later. Eleven of 12 families returned. They are all very enthusiastic. They brought their habit books which they had kept pretty meticulously. (Project 8, diary entry, 1/29/04)

We are also experiencing profound disappointment expressed by patients who do not qualify for the study . . . many patients are desperately seeking help. (Project 14, diary entry, 2/13/04)

Patients’ Preference for Personal Contact

We have no one that has selected the self-help condition, as of yet . . . Telephone is the more popular choice at this point. (Project 2, diary entries, 2/17/04 and 2/19/04)

Theme 2: Training and Supporting Practice Extenders

Several projects used practice members or practice extenders such as lay coaches or nonclinical peers to deliver health behavior counseling. One benefit of this approach was that moderate to intensive health behavior counseling could be offered while minimizing the impact on practice routines and resources. Our analysis highlights another benefit. In the context of practice extender–patient relationships, patients may share personal stories around behavior change, and for some doing so may be important to the change process. In one project, the intensity and depth of personal experiences patients shared was surprising to investigators and may have arisen from the nonthreatening and supportive relationship the practice extenders created.

For example, a diary keeper noted the following:

My follow-up phone contact with the client on Friday was intense and lengthy (45 min). She began sobbing within one minute of my open-ended question, “How has your week been?” I also had a long telephone interview with a medical student who has
struggled with obesity and suffered bulimia since age 12. She spoke eloquently about the internal workings of overweight folks in her experience. She spoke of a kind of numbness that feels both good and bad. That was new to me. She talked about shame and depression. (Project 9, diary entry, 9/19/03)

Although physician extenders relieve practices of work involved in facilitating and supporting health behavior change in patients, resources are needed to support physician extenders financially and provide extensive and continuous training. In addition, patients and extenders would benefit from access to a local care team (eg, clinicians, psychologists, social workers) for follow-up, consultation, and referral for treatment of issues that surface during counseling sessions, such as depression. One physician extender’s diary entries suggests that she felt inadequately trained and supported and, after several months of working with patients, began to experience burnout, reporting that she felt exhausted having “less compassion for the patients” and trying “to continue to be cordial and empathetic, but the energy demanded of contacts drained me.” (Project 9, diary entry, 7/6/04).

Theme 3: Adapting Tools and Techniques to Primary Care Practice

Tools and techniques used in Prescription for Health interventions include Web-based resources, handheld computers or personal digital assistants (PDAs), e-mail follow-up, action plans and forms, lay coaches/community health associates, statewide and local telephone counseling, group visits, pedometers and walking groups, and prescription pads. Many of these approaches were not specifically developed for practice settings and, therefore, did not automatically fit well. For example, research teams modified action plan forms to fit with clinical practice (Project 17, field notes, 1/18/04), and another project tailored their coaching strategy to suit practice staffing patterns and work demands (Project 12, field notes, 3/31/04).

Although all projects managed to develop and integrate their behavior change tools, all seriously underestimated the time and effort needed to integrate and adapt these approaches to the primary care setting. For some, mobilization of other resources provided economic and intellectual support critical to this effort. Tool development was a labor-intensive process involving both special technical expertise (eg, software developers) and an understanding of the practice environment. For example, a Project 11 diary entry reported a list of information technology activities ranging from having meetings with computer programmers to discuss the big picture, as well as specifics on Internet service provider (ISP) algorithms, to registering domain names, obtaining permission from the Outreach Office to use an external domain to point to a university server, setting up Web space on a secure server, testing file transfer protocol (FTP) software and a beta version of the Web site, and so forth. Other projects noted similar activities:

Computer support feels using the Palm has its advantages as a collection device, but we’ve learned through experience that remote support of users is not easy. You have to deal with installation of Palm software on remote PCs, installation and support of the program on the Palm (and there’s little control of what else the practices put on the machine), network issues, and general end-user support. (Project 7, diary entry, 10/10/03)

Software issues were discussed and the final copy edits are being completed on the Palm version. The PC version is also getting closer to completion. Final testing will be performed prior to deployment. (Project 15, diary entry, 5/21/04—9 months into Round 1)

Developing tools that rely on computer-based technologies requires the early involvement of experts (eg, computer programmers, designers), not only to design, develop, and customize these tools, but also to work with the research team to develop realistic timelines that include time for pilot- and beta-testing. Integrating a new tool or approach into a primary care practice (computer-based or not) requires a good understanding of the practice’s systems. The collection of practice-level data aimed at identifying systems of organization and routine care processes in practices would help researchers tailor their tools to better fit the practice setting.

Theme 4: Using an Implementation Model to Guide Practice Change

Most Prescription for Health interventions asked practices to make substantial changes to their organization, including modifications to their work routines and systems of care (eg, referring to a new program, using a new tool or protocol, engaging in action planning). We examined grant applications, site visit notes, and diary data to look for references or allusions to characteristics identified in the literature as important for integrating innovations into primary care practices for sustainable change, such as stakeholder motivation, leadership, role of local champions, practice capacity and resources for change, external environment, and perceived benefit.15,16 We found that few projects used a formal change model or proactively considered these characteristics.

Project diary entries highlight the potential consequences of this omission. For example, the need to consider stakeholder motivation and perceived benefit was apparent when an innovation (eg, PDAs, Web-based resources) was designed to replace an existing process that practices perceived as satisfactory. Project 13 diary entries (1/14/04 and 2/2/04) chronicle the many telephone calls and personal visits involved in recruiting practices. In more than 1 practice, the Web-based

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516
system the researchers offered seemed to be replacing a paper-based educational system, and clinicians did not appear eager to make this change. To encourage this transition, the research team attempted to tailor the new system to the practices by offering paper versions of educational materials posted on the Web:

Practices are selecting some materials that they would like to have on hand for their education files. Stacey is checking and requesting permission again from each source and being sure that the source is appropriately cited on each document. (Project 13, diary entry, 2/18/04)

Similar difficulties were observed for nontechnological interventions. As the following entry suggests, clinicians may be motivated to enhance preventive service delivery, but they may not see the value in changing aspects of their existing system:

Dr. stated he was quite confident he is addressing all behaviors and 5 As thoroughly and was satisfied to remain status quo. He stated he did use catch-all phrases like lifestyle modification as documented evidence and assurance that he is addressing all behaviors and believes that he would be “Covered in a court of law.” (Project 5, diary entry, 1/1/04)

Additionally, contact with research teams was required for problem-solving, and in many cases investigators needed to work with practice leaders and administrators to mobilize the resources necessary to implement an intervention. The following entries describe these interactions:

We are trying to work out a process that will allow the clinics to incorporate the action plan process into their regular routine after we are gone. (Project 17, diary entry, 9/24/03)

Biller receives request for chart identification. Spends several hours in one day trying to meet request and cannot. Doctor notes that this is too costly. Requests to be dropped from study. I follow up with doctor. “If we can get the PHO (Physician Health Organization) to do this for you would that make it ok?” “Much better.” (Project 5, diary entry, 11/11/03)

All the clinicians that have been enrolled seem excited about the program, but I know from personal experience (since we at the University have had access to the program) that it is very easy to forget to actually make the referral. We are currently discussing ways to keep the P4H [Prescription for Health] program on the minds of the clinicians. (Project 1, diary entry, 1/7/04)

Although research teams were flexible when tailoring interventions to practices, this process was commonly problem-focused and reactive. There is little evidence to suggest use of a formal organizational change model to guide these efforts proactively.

**Theme 5: PBRN Research Philosophy and Project Management Approach**

Our data suggested that several participating PBRNs, particularly those with a long history of successful PBRN research, had well-developed strategies for generating enthusiasm for participation in studies and managing the research projects conducted in their PBRN. There was evidence that this extensive research experience, as well as a history of conducting projects with finite endpoints (eg, card studies and chart audit surveys), may have socialized research teams and members into a “project mentality,” leading them to regard interventions as finite research projects that have definable endpoints rather than improvements that may become a permanent part of the practice organizational design. Such experience and views are evident in the following entries:

This clinic will be upgrading their status in the PBRN from ruby to diamond as they participate in the P4H project. This is especially good news as it represents their willingness to assume more family practice based research projects in this clinic. (Project 2, diary entry, 11/17/03)

The doctor was interested in the project and expressed a bit of concern on the side of the physicians since they see 36 patients a day each physician. He mentions that the “demand for patient care is so high … Only 36 patients will need follow up calls (2 more) until the study ends …” At the end of the conversation, he supported the idea behind this project and agreed that he will supervise the progress of this project until the end of the study. (Project 12, diary entry, 5/24/04; A-Team emphasis added)

As usual, we have some “producers” and some “non-producers” in the clinic. Thanks goodness for the real time recruitment Web site. Because of it I have been able to identify and call all of the clinics who are behind schedule. (Project 2, diary entry, 4/26/04)

The idea that there are producers and nonproducers in terms of practice recruitment, and that practices just need to make it until the end of the study suggests that PBRN researchers and practice members view their implementation of interventions as a short-term obligation, not necessarily as a long-term practice improvement. Fostering this kind of project approach or project mentality may well be counterproductive if a study seeks to stimulate the practice to make sustained changes to its existing care processes. In fact, there are a number of diary entries, such as those above, that appear to set up an expectation among physicians that the goal of the research is to enroll a set number of patients and that this goal was all that was expected for participation. Bodenheimer et al further discuss the tensions between PBRN research and the realities of practice.

**DISCUSSION**

The RWJF’s Prescription for Health initiative demonstrates the enormous opportunity that exists to foster health behavior change and underscores the critical role primary care practices can and should play in the
widespread delivery of these services. We nevertheless uncovered the unanticipated difficulties encountered by some projects when attempting to implement their interventions, as well as the apparent lack of sustainability of these projects in the practice setting. Our analysis suggests 3 steps that may improve the feasibility and sustainability of PBRN research around health behavior interventions.

First, research team members need a strong understanding of the organizational features of practice that have been shown to mediate successful implementation of practice change interventions. In Round 1 of Prescription for Health, several well-crafted, potentially useful innovations had poor uptake, and others were too resource-intensive for practices to implement without external assistance. Understanding practice organization and using a practice change model to inform study design can proactively cultivate research projects that are better aligned with the needs, resources, and capacities of primary care practices.18-21

Second, PBRNs and research teams attempting to develop strategies for promoting healthy behaviors in the primary care setting need to develop collaborative multidisciplinary teams that bring together experts in such areas as information technology, patient care and counseling, community outreach, clinician education, and practice organization and change. The collaborative effort of such experts is needed to develop realistic and comprehensive interventions for health behavior change that not only help clinicians identify patients who need to change and are ready (eg, for interventions involving PDAs, Web-based systems), but also assist clinicians when discussing behavior change with patients (eg, for interventions involving action planning, PDA-driven protocols) and provide the counseling and support needed to make and sustain such changes (eg, for interventions involving individual and group coaching and counseling, telephone counseling). Multidisciplinary teams need to think about how to combine the functionality of several of the interventions tested under this initiative, and how to do this in a way that is both feasible and sustainable at the practice level.

Third, as more PBRNs gain experience in conducting research, PBRN leaders need to reflect on their philosophy and approach for managing the research process. The steps PBRNs may take to motivate practices, to ease the burden a research project places on a practice, and to develop organizational systems for managing multiple projects simultaneously may inadvertently detract from the basic purpose of PBRNs—to provide a research laboratory that embodies real-life practice. Additionally, although some projects may be endpoint-oriented, others may need to be handled differently and in ways that foster long-term sustainable quality improvements. PBRN leaders and researchers need to be aware of how their handling of a research project may have implications for how the practice treats an intervention, for example, whether it is viewed as a short-term or a long-term change.

Our study is not without its limitations. The data we collected as part of our evaluation were not consistent across all projects. Each project had different research goals, and study designs varied greatly. As a result, comparing similar experiences or identifying themes that arose across all projects was difficult. When possible, we took steps to fill these gaps. Additionally, although some projects were very generous in taking the time to make detailed and insightful diary entries, others were less inclined to do so. The depth of our understanding of a project’s implementation experience depended in large part on the quantity and quality of its diary entries, and there was great variation across projects and across diary keepers. We moderated the potential impact of this limitation by taking steps to encourage teams to make diary entries and by soliciting experiences among similar sets of projects to ascertain a wide range of experiences around an emergent theme.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S12.

Key words: Behavior; health behavior; health promotion/disease prevention; practice-based research; practice of medicine; health care delivery; primary care

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Putting It Together:
Finding Success in Behavior Change
Through Integration of Services

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ABSTRACT

PURPOSE The purpose of this analysis and commentary was to explore the rationale for an integrated approach, within and outside the office, to help patients pursue healthy behaviors.

METHODS We examined the role of integration, building on (1) patterns observed in a limited qualitative evaluation of 17 Prescription for Health projects, (2) several national policy initiatives, and (3) selected research literature on behavior change.

RESULTS The interventions evaluated in Prescription for Health not only identified unhealthy behaviors and advised change, but also enabled patients to access information at home, use self-help methods, obtain intensive counseling, and receive follow-up. Few practices can replicate such a model with the limited staff and resources available in their offices. Comprehensive assistance can be offered to patients, however, by integrating what is feasible in the office with additional services available through the community and information media.

CONCLUSIONS Blending diverse clinical and community services into a cohesive system requires an infrastructure that fosters integration. Such a system provides the comprehensive model on which the quality of both health promotion and chronic illness care depend. Integrating clinical and community services is only the first step toward the ideal of a citizen-centered approach, in which diverse sectors within the community—health care among them—work together to help citizens sustain healthy behaviors. The integration required to fulfill this ideal faces logistical challenges but may be the best way for a fragmented health care system to fully serve its patients.


INTRODUCTION

Addressing health behaviors in primary care involves a familiar sequence of steps: (1) identifying the behavior(s) in question, (2) giving brief advice, (3) setting goals, (4) arranging for more intensive assistance, and (5) ensuring follow-up. This sequence of tasks is embodied in a variety of models for behavioral counseling, notably the 5 A’s—assess (ask about the behavior status and the factors affecting change), advise (give a clear, personal message of encouragement to change), agree (set goals based on readiness to change), assist (use behavior change techniques, such as self-help, counseling, or both, to promote acquisition of the skills, confidence, and environmental supports for change, supplemented by medical treatments when appropriate), and arrange (schedule follow-up contacts, including referral for more intensive treatment). This sequence of tasks is embodied in a variety of models for behavioral counseling, notably the 5 A’s—assess (ask about the behavior status and the factors affecting change), advise (give a clear, personal message of encouragement to change), agree (set goals based on readiness to change), assist (use behavior change techniques, such as self-help, counseling, or both, to promote acquisition of the skills, confidence, and environmental supports for change, supplemented by medical treatments when appropriate), and arrange (schedule follow-up contacts, including referral for more intensive treatment). The effectiveness of clinicians in promoting healthy behaviors and the quality of their service to patients are probably maximized when practices have systems in place to support this entire counseling sequence—all of the 5 A’s—rather than simply components of the process. Systematic reviews and clinical experience have shown that practices that use multifaceted inter-
ventions are more effective in promoting healthy behaviors than those that institute isolated measures.1,14

How might such a comprehensive system look in conventional primary care practices? In a perfect world, it would include a redesigned system of office practice that would enable clinicians to offer the full range of services, aided by trained counselors and information technology and adequately reimbursed by payers. Such an idealized office design, as envisioned by the Future of Family Medicine project,7 would be part of an overall restructuring of the health care system that experts now consider vital.8 Until that restructuring occurs, however, strategies to promote health behavior change must be pragmatic. The model must be realistic and compatible with the competing demands of today’s practice environment, minimizing intrusion on the productivity of clinicians and their limited time.

We sought insight into this issue by performing a limited qualitative evaluation of the interventions tested in the first round of the Robert Wood Johnson Foundation’s Prescription for Health program. As described in more detail by Cifuentes et al9 and others in this supplement, this program provided funding to 17 primary care practice-based research networks to test interventions for unhealthy behaviors (smoking, unhealthy diet, physical inactivity, and risky alcohol use) among patients in their practices. In this commentary, we use our analysis of these projects as a point of departure for examining larger lessons about the role of integrated services, both in primary care and in the community at large, in promoting healthy behaviors.

METHODS
We reviewed original proposals and interim reports from each of the 17 Prescription for Health grantees, and classified each intervention within the 5 A’s framework (Table 1). Each grantee verified that our list included all interventions evaluated in their project, and approved the 5 A’s classification assigned to each intervention. We also examined themes shared by the investigators at grantee meetings convened by the foundation and themes identified in evaluations sponsored by the foundation.3 Finally, using a focused literature review, we examined the concordance between these themes and the attributes of integration that figure prominently in research and national policy initiatives.

RESULTS
Insights From Prescription for Health: Integration of Services to Achieve Comprehensive Care
Our review of the Prescription for Health projects found that pragmatic features were common among the interventions tested, an outcome reflective of the program’s design. The original call for proposals from the foundation specified that applicants test interventions that could be “easily adopted” and complete their projects within 16 months; project grants could not exceed $125,000. These constraints precluded the testing of complex or protracted interventions, and fostered innovation among grantees to fashion interventions that ordinary practices could implement.

Few Prescription for Health projects were able to evaluate a comprehensive system for promoting behavior change. The interventions instead addressed selected components of the 5 stages of counseling (Table 1). Some interventions screened for unhealthy behavior, some changed the way advice was given, some focused on goal setting, and some provided more intensive assistance. In only 4 projects did the interventions address all of the 5 A’s.

Although no Prescription for Health project was totally comprehensive, when the projects’ interventions are examined as a whole, the design of a complete system to fully support behavior change takes form. A synthesis of the projects (Figure 1) presents a vision for an integrated, multifaceted system with realistic potential for implementation in primary care settings. Practices that wish to support each of the 5 A’s can choose from the menu of options in the figure, tested by the grantees, to (1) identify unhealthy behaviors (eg, by health risk appraisals), (2) offer brief advice, (3) set collaborative goals and action plans (eg, behavior “prescriptions”), (4) provide more extensive information (eg, handouts, interactive Web sites), counseling (eg, in-office coaches or community health advisors, telephone counseling, group didactic sessions, and support groups, some using motivational interviewing), and self-help tools (eg, guidebooks, pedometers, activity logs, food diaries), and (5) arrange follow-up and reinforcement (eg, health buddies, e-mail or telephone follow-up).

Other strategies not tested under Prescription for Health offer additional options for supporting behavior change. Examples include computer-generated physician and patient reminders and e-mails, chart reminder stickers and flow sheets, examination and waiting room posters, teamwork interventions, patient-held health diaries, and interactive technologies (eg, Web-based resources, clinic-based CD-ROMs, interactive voice-response telephone calls).10,11

Integration Between the Practice and the Community: Reaching Out Beyond the Clinic
Intensive counseling can enhance behavior change but is often beyond the capacity of ordinary primary care practices, which lack the time and resources for such follow-up. As Cohen et al14 describe in this supplement, Prescription for Health grantees discovered that deliver-
ing high-quality counseling often taxed the capabilities of practices and their staff. Some interventions required clinicians to undergo extensive training or to depend on practice extenders and external support from research teams. The long-term sustainability of such self-contained interventions is unclear, and their generalizability to practices across the country is uncertain.

Real-world practices that lack the resources to replicate intensive approaches within their offices can still ensure that patients receive high-quality counseling by reaching out beyond the office—establishing integrated linkages with information and community resources. The few minutes that clinicians and staff have with patients can then be used for what clinicians do best: identifying the behaviors and conveying to patients the importance of change. As Stange et al have advocated, these first steps can be leveraged into more effective interventions if they connect patients with professionals and programs—within or outside the office—that can provide more extensive follow-up. As with any consulting relationship, these resources should work in concert with primary care professionals in a team approach, reporting to and consulting with clinicians as counseling progresses, and integrating follow-up into ongoing health care.

Certain smoking cessation models provide an example of the use and integration of resources beyond the office. In some states and health systems, clinicians can identify smokers (assess) and offer brief advice (advise) in the office and then refer patients to telephone quit line programs that can offer more intensive counseling (assist, arrange). The best models, as in Massachusetts’ quit line program, have a feedback component that enables counselors to share progress reports with the primary care clinician as part of a longitudinal team relationship. A research network in Virginia that was a grantee under Prescription for Health is now conducting a randomized trial, funded by the Agency for Healthcare Research and Quality, to test whether this integrated counseling model increases the quality of the assistance that smokers receive.

A number of Prescription for Health projects pursued this approach, testing interventions that reached...
## 4. More Intensive Assistance (Assist)

<table>
<thead>
<tr>
<th>Information</th>
<th>Counseling</th>
<th>Self-Management</th>
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<tbody>
<tr>
<td>Web database of community and behavior change resources</td>
<td>Health change facilitator</td>
<td>Telephone follow-up by practice extender</td>
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<tr>
<td>Personalized handouts</td>
<td>Stage-based counseling</td>
<td>E-mail follow-up by health advisor based on action plan</td>
</tr>
<tr>
<td>Web site information tailored to patient responses</td>
<td>Individual counseling, group visits, and referral to community services</td>
<td>Telephone call 1 wk and 6 mo later</td>
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<tr>
<td>Stage-tailored and need-specific educational materials, lists of local resources</td>
<td>Self-management supported by automatic feedback to patient, feedback to clinician, and Web-based problem-solving module</td>
<td>Telephone/e-mail follow-up by RNs; follow-up visits as indicated by responses to vital sign process or feedback from Web health assessment</td>
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<tr>
<td>Mailed educational materials</td>
<td>Referral to community services</td>
<td>Telephone follow-up by nurses or community service</td>
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<tr>
<td>Print or online motivational information</td>
<td>Support group; nutritionist-led didactic sessions; motivational videos</td>
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<td>Written lesson plans for didactic sessions</td>
<td>Self-help guidebook; Web site; community resources and programs</td>
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<td>Literature</td>
<td>Food diaries; pedometer counts</td>
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<td>Handouts and homework</td>
<td>Support group; nutritionist-led didactic sessions; motivational videos</td>
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<td>Age- and nutritional status-specific handouts on health behaviors</td>
<td>Self-monitoring books</td>
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<tr>
<td>Educational bulletin board; educational materials</td>
<td>Health change facilitator; decision balance exercise; other motivational techniques</td>
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<tr>
<td>Web database of community and behavior change resources</td>
<td>Health educator group sessions</td>
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<tr>
<td>Patient resources suggested by PDA software</td>
<td>Self-help guidebook</td>
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</tbody>
</table>

## 5. Reinforcement, Follow-up (Arrange)

- **Feedback logs**
- **Mailed educational materials**
  - Scheduled longitudinal telephone counseling
  - Faxed feedback to referring physician
- **Print or online motivational information**
  - Telephone or Web-based motivational counseling
  - Telephone and e-mail follow-up by clinics; follow-up visits
- **Written lesson plans for didactic sessions**
  - Support group; nutritionist-led didactic sessions; motivational videos
  - Telephone follow-up by educator; health buddies; community activities (see Table 2)
- **Literature**
  - Support group; nutritionist-led didactic sessions; motivational videos
  - Follow-up visit
  - Pedometer; activity log
  - Telephone follow-up by nurse-coordinator; biweekly nurse practice visits for weight and BP checks, pedometer downloads, and activity log assessment
- **Handouts and homework**
  - Health educator group sessions
  - Telephone follow-up
- **Age- and nutritional status-specific handouts on health behaviors**
  - Self-monitoring books
- **Educational bulletin board; educational materials**
  - Health change facilitator; decision balance exercise; other motivational techniques
  - Telephone follow-up
- **Web database of community and behavior change resources**
  - Health change facilitator follow-up in person, by telephone, by e-mail
- **Patient resources suggested by PDA software**

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5 A’s = assess, advise, agree, assist, arrange; ACORN = Virginia Ambulatory Care Outcomes Research Network; APBRN = Alabama Practice Based Research Network; BMI = body mass index; BP = blood pressure; CalEnet = Colorado Research Network; CECH = Center to Enhance Child Health Network; CRN = University of California at San Francisco (UCSF)/Stanford Collaborative Research Network; COOP = Dartmouth-Northern New England COOP Project; GRIN = Great Lakes Research Into Practice Network; HPRN = High Plains Research Network; KAN = Kentucky Ambulatory Network; MAPRN = Minnesota Academy of Family Physicians Research Network; MWCORN = Midwest Nursing Centers Consortium Research Network; NECF = New England Clinicians Forum Practice-Based Research Network; NOPCRN = Northwest Ohio Primary Care Research Network; PBRN = practice-based research network; PDA = personal digital assistant; PitNet = Pediatric PitNet; PPRG = Pediatric Practice Research Group; PSARN = Pennsylvania State Ambulatory Research Network; RAP = Research Association of Practices; RN = registered nurse; VaPSRN = Virginia Practice Support and Research Network.

Beyond the office to enable patients to access information at home (eg, through interactive Web sites), to use self-help methods (eg, guidebooks), to access intensive counseling after leaving the clinic (eg, intensive in-person or telephone sessions with trained counselors in the practice or through community health alliances), and to obtain follow-up and reinforcement over time (eg, health buddies, telephone or e-mail follow-up). Almost every project provided patients with resources that they could use at home to act on the advice they received in the office (Table 2). That so many grantees turned to this approach reflects not only the logic of leveraging, but also a recognition of the impracticality of the alternative: expecting practices to rely on their
own staff and resources to deliver intensive counseling and follow-up, often with limited or no reimbursement.

Aside from its pragmatic value to practices, this outreach is potentially more useful to patients because the work of lifestyle change occurs outside the clinic. An approach to health promotion that is restricted to the clinical encounter ignores the basic principles of the socioecological model and compromises the effectiveness of health behavior counseling. Clinicians’ time with patients represents a tiny fraction of patients’ daily lives, and clinicians’ efforts have limited impact on patients’ health behaviors if conditions at home, at work, at school, and in the community are not supportive.

Parallels in Chronic Disease Management

The same philosophy of integrated and comprehensive care is embedded in current thinking about how best to
manage chronic disease. Good outcomes in chronic diseases cannot be expected without providing patients with the knowledge, tools, and support to incorporate self-care into their daily lives. Systems of care are investing resources to expand the infrastructure required for coordination. More than 500 health care organizations have participated in the Breakthrough Series, sponsored by the Institute for Healthcare Improvement, to pursue comprehensive systems change to improve chronic illness care. They are establishing teams that streamline and integrate the work of health professionals and community services. They are installing reminder systems for clinicians and patients, and adapting information technologies to better link clinicians and consumers with each other and with relevant knowledge information.

Similar support is needed to help patients achieve and sustain behavior change, suggesting the need to think more broadly about the aims of redesigning systems. Designing and investing in bridging systems that connect practices with implementation strategies outside the office can reap benefits simultaneously in the domains of disease prevention and chronic illness care. To focus on only one domain is a lost opportunity to maximize public health impact and efficiency. The distinction is also alien to primary care, which provides both disease prevention and chronic illness care, often to the same patient and sometimes in the same visit. System changes made by practices for health promotion or chronic illness care accrue to the benefit of all patients: for example, the reminder system that prompts the clinician to perform a foot examination in a diabetic patient can also prompt questions about smoking status, and the telephone counseling program that supports physical activity can, with augmentation, support self-management in patients with heart failure.

The Bigger Picture: A Citizen-Centered Approach

The integration of primary care with the community and with information resources, as occurred in Prescription for Health projects, is a first step in fulfilling a much larger need—faced by communities—to provide a web of integrated services to help citizens sustain healthy behaviors. Ideally, a person who chooses to become physically active should find a community working together to support the effort. The individual’s physician might recommend exercise, but local media and advertising can reinforce the message, employers can offer incentives, and the built environment (eg, neighborhood walkways) can be redesigned to foster outdoor activity.

A diverse collaboration is required to give citizens a seamless support system for healthy diet, physical activity, smoking cessation, and moderation in alcohol consumption. It includes not only local health systems but also school boards, parks, workplaces, churches, bars, restaurants, theaters, sports centers, grocers and other retail outlets, volunteer organizations.
senior centers, news media, advertisers, urban planners, and the leaders who set direction for these sectors.

Community-level integration of this type is beginning to emerge in many communities, often through concerted efforts such as the Steps to a Healthier US Cooperative Agreement program. In 2004, this US Department of Health and Human Services program issued $6 million in grants to 40 communities to develop integrated community action plans to reduce the burden of diabetes, overweight, obesity, and asthma, and to address risk factors such as physical inactivity, poor nutrition, and tobacco use.

One Steps grantee (Seattle and King County, Wash), for example, has undertaken a comprehensive approach that involves media, policy makers, schools, workplaces, health care, and the community in a 100-member consortium that includes clinicians, hospitals, health plans, universities, community organizations, faith groups, government agencies, and school districts. Their work with clinicians establishes integration between patient care and the community by using chronic disease and wellness coordinators to facilitate systems change, linking patients with community resources, and using case management. Their citizen-centered approach takes integration to a much broader community level. Examples of their comprehensive efforts include promoting community and housing policies that support physical activity, discouraging sales of nonnutritious foods at schools, and working with faith communities to train lay educators in health promotion.

The Challenges of Integrating Clinical and Community Services
Integration makes sense but is hardly straightforward. Systems to help practices reach out beyond the office encounter logistical challenges, as Prescription for Health grantees discovered. Projects in Minnesota and Pennsylvania developed self-help materials but found that patients preferred telephone or face-to-face interpersonal contact. A Kentucky project found that only 500 of 15,000 patients who received postcard invitations to obtain telephone counseling called the program to arrange services. Projects in Virginia, Ohio, and Minnesota developed Web sites to facilitate behavior change but encountered technical challenges and low use rates. A New Hampshire project found that receiving e-mail messages was unpopular with adolescent patients. Projects using practice extenders required resources for training and efforts to maintain coordination with primary clinicians and to ensure privacy of data.

Substantial resources are required to build an infrastructure within health care that integrates primary care practices and communities. The sources of funding to establish this infrastructure and their long-term sustain-ability are unclear. Tobacco quit lines, for example, have struggled as state budgets, a primary funding source, have tightened. For integration to be truly viable, these and other counseling resources to which clinicians might refer patients require stable funding; in addition, clinicians and health systems will expect reimbursement for the added work entailed in establishing and maintaining ties with diverse community services. Finally, the very definition of integration and the performance measures that evaluators would use to know when it exists require development.

CONCLUSIONS
The formidable challenges to integration must be overcome to make it a key feature of the future transformation of health care. Integration, the natural answer to the current fragmentation of health care, was highlighted by the Institute of Medicine as a national priority. The importance of integrating clinical and community services was evident in the Prescription for Health experience, but a similar lesson has been echoed in other quality improvement projects of the Robert Wood Johnson Foundation. Integration is a recurring theme in the foundation’s work with other agencies (eg, the Institute for Healthcare Improvement, the MacColl Institute for Healthcare Innovation) and figures prominently in programs that bridge clinical practice and the community (eg, Pursuing Perfection, Improving Chronic Illness Care, Innovative Care for Chronic Conditions and that build partnerships between the community and public health agencies (eg, Turning Point).

The prominence of integration and primary care in so many of these quality improvement programs underscores their vital role in drawing together the services that patients require to address their health needs. Over time, the premier quality improvement initiatives and accompanying research, including the second round of Prescription for Health, will clarify whether integration of services improves the health and satisfaction of the population. These insights might suggest solutions to the logistical barriers to implementing integration. Morbidity, mortality, and health care costs can be substantially reduced by even modest reductions in unhealthy behaviors. If the hard work of building a comprehensive system to support healthy lifestyles can make a difference, it is a cause well worth pursuing.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/3/S20.

Key words: Integration; coordination; primary care; health promotion; health behavior; chronic disease; self-management; community services

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References


Practice-Based Research in Primary Care: Facilitator of, or Barrier to, Practice Improvement?

ABSTRACT

PURPOSE In what ways is primary care practice-based research a facilitator of practice improvement vs a barrier to practice change? This article aims to alert investigators to the pitfalls they may face in undertaking the dual agenda of research and practice improvement.

METHODS We derived examples of the relationship between the research and practice improvement goals of 17 Prescription for Health (P4H) grantees from verbal communications with the grantees, field notes from interviews and site visits, and entries made by grantees to an online diary managed by the P4H Analysis Team.

RESULTS An analysis of key themes identified factors facilitating and impeding the dual goals of research and practice improvement. The requirements of conducting research mandated by institutional review boards, including patient enrollment and consent, often constituted barriers to practice improvement. The choice of practices in which to conduct research and improvement activities and the manner in which the practices are approached may affect the outcome of both research and practice improvement goals. Approaching practices with a time-limited project mentality can interfere with a process of permanent practice change. The RE-AIM construct (reach, efficacy/effectiveness, adoption, implementation, and maintenance) is useful in designing research interventions that facilitate practice improvement.

CONCLUSIONS Projects that meld research studies and practice improvement goals must pay attention to the potential conflicts between research and practice change, and must attempt to design research studies so that they facilitate rather than inhibit practice improvement.

INTRODUCTION

Evidence-based medicine has traditionally relied on efficacy research—research conducted under relatively ideal, controlled conditions. The conclusions of efficacy research, however, may not be appropriate to real-world conditions in which medical practices face multiple competing demands and patients have a variety of comorbidities and personal preferences. Efficacy research, moreover, is often conducted in academic medical center sites whose populations are not representative of the general US population. In contrast, effectiveness research refers to studies conducted under real-world conditions.

More than one half of all office visits in the United States are to primary care practitioners. Effectiveness research for many clinical questions thus needs to be conducted in primary care settings. Practice-based research networks (PBRNs) have been created as primary care laboratories for conducting effectiveness research.
PBRNs have recently assumed a function separate from but related to their research mission: practice improvement. There is growing awareness that primary care is not able to live up to its promises to provide high-quality and accessible chronic illness and preventive care to all patients.\(^5\)\(^6\) Given these problems, PBRNs are increasingly seen as institutions that can simultaneously conduct effectiveness research and catalyze practice change.

A number of authors have reported on PBRN-based research with implications for practice improvement.\(^7\)\(^10\) These authors, however, do not comment on difficulties that may arise in balancing the dual goals of research and practice change.

In this article we explore the question, Is practice-based research in primary care a facilitator or a barrier to practice improvement? The discussion uses as a framework the RE-AIM model developed by Glasgow and colleagues.\(^11\)\(^13\) The purpose of the article is to alert investigators to the pitfalls they may face in undertaking the dual agenda of research and practice improvement.

The 5 components of RE-AIM are reach, efficacy/effectiveness, adoption, implementation, and maintenance. Reach refers to the percentage and representativeness of the at-risk population affected by a quality improvement intervention. Efficacy/effectiveness signifies the extent to which the intervention enhances the outcomes of each person touched by the improvement. The AIM portion of the RE-AIM model turns attention to the organization in which a quality improvement intervention takes place. What proportion of organizations adopt the intervention as a practice improvement, and are these organizations a representative sample? Is the intervention implemented by the organization in which the study takes place, and is it maintained over time? In the Results section below, references to these RE-AIM components are italicized.

### METHODS

#### Design

We conducted a cross-case content analysis on data gathered from 17 PBRNs receiving grants from the Robert Wood Johnson Foundation’s P4H program to study and encourage the adoption of interventions to improve patients’ health-related behaviors.\(^14\)

#### Data Collection

Qualitative data included verbal communications with grantees, field notes from interviews and site visits, and entries that project team members made to an online diary managed by the P4H Analysis Team (A-Team). The primary data source was online diaries written by investigative team members involved in project implementation. The A-Team responded to entries to encourage clarification, elaboration, and reflection among project members. Entries were loaded into Folio Views (ver 4.11; Open Market Inc, Burlington, Mass), a data management program. Quotations cited in the Results section came from project diary entries and statements made by grantees at the September 2004 P4H closing convocation.

#### A-Team Analysis

The A-Team’s approach for analyzing these data is discussed by Cohen et al\(^15\) in this supplement. Weekly meetings were conducted to review and reflect on diary entries using an immersion-crystallization approach.\(^16\)\(^17\) Overarching organizing themes were identified for each grantee. This iterative process resulted in 17 preliminary case reports that articulated project themes in a comprehensive manner. These summary reports were then used to create a cross-case comparison to identify themes common to multiple grantees. Project members were frequently consulted for clarification of discrepancies and confirmation of A-Team findings.

Based on the oral presentations of P4H investigators at the closing convocation, the authors (including 1 member of the A-Team) identified cross-cutting issues important to multiple P4H investigators. Four themes were apparent: working with institutional review boards (IRBs), the influence of the patient consent process, appropriate patient selection for research projects, and sustaining practice involvement in research. Further in-depth interviews with investigators were conducted to better understand how these issues manifested themselves in the implementation of their studies. The A-Team member then conducted a word search of the A-Team database for each theme and reanalyzed the resulting sections in the database. For the IRB theme, the words “IRB” and “HIPAA” (Health Insurance Portability and Accountability Act) were used. For the patient consent theme, the word “consent” was used. For the sustainability theme, the words “sustainability” and “recruitment” were used. Data were de-identified before they were shared with the coauthors. This additional examination confirmed that the themes presented in the Results section were of concern to several investigators and may provide useful insight for those considering similar research.

### RESULTS

Grantees faced challenges when attempting to conduct research and encourage practice improvement at the same time. These challenges included (1) obtaining IRB approval for projects that are unlike typical clinical research trials, (2) the impact of the consent process,
long consent forms. This consent process complicated patients often involved research assistants explaining into their research studies. The process of enrolling Almost all grantees enrolled patients, caregivers, or both The Research Consent Process research is noninvasive.

consent should not be so problematic because the practice assessment part of the study reported that the practice assessment part of the study PBRN-based research assesses practices. One grantee working with IRBs. For most P4H grantees, gaining IRB approval posed a barrier to research and practice improvement goals, thereby limiting the adoption of improvement activities by primary care practices. Although slow IRB processing and elaborate paperwork are common to all research, PBRN-based research adds further complications. Because PBRN research is conducted in multiple practices, both academic and community-based, IRB approval from several institutions may be required. Grantees stated, “A check of IRB status across the 8 sites found that 7 of 8 are still working on IRB approval. Each board has different takes on the research,” and “Our major problem is convincing 1 of the 2 institutions to extend assurance for unaffiliated physicians in the 1 practice that does not fall under either IRB.”

IRBs have experience evaluating traditional randomized clinical trials in which their primary role involves protecting patients. Lack of experience with PBRN-based research may lead to cautious and less flexible behavior from IRBs. In addition to studying patients, PBRN-based research assesses practices. One grantee reported that the practice assessment part of the study had to be dropped because of IRB opposition. One grantee spoke for many others in expressing that IRB consent should not be so problematic because the research is noninvasive.

The Research Consent Process
Almost all grantees enrolled patients, caregivers, or both into their research studies. The process of enrolling patients often involved research assistants explaining long consent forms. This consent process complicated the implementation of practice improvement interventions.

First, the consent discussions sometimes interrupted patient flow. Because smooth patient flow is critical to the tight appointment schedules universal in primary care, its interruption may alienate practice personnel from the project. One grantee reported that practices motivated to conduct the study complained of difficulties enrolling patients, who demanded staff time to answer questions about the study.

Second, the consent process changed the nature of the intervention. In 2 cases, this change turned out to have a positive impact, with the patient consent discussion activating patients to consider healthy behavior changes. One grantee said, “The consent process was an important element in initiation of successful behavioral change.”

Whether patient consent requirements facilitate or complicate a behavior change and practice change intervention, it must be recognized that the very process of obtaining consent shifts an effectiveness study toward an efficacy study by moving the intervention away from a real-world situation.

Study Patients vs Appropriate Patients
There is a difference between asking practices to recruit a specified group of patients for a study and engaging practices in projects that improve the care of all patients with a particular health problem. The former approach restricts the reach of the intervention by reducing the percentage and representativeness of the at-risk population affected by an intervention study.

Some grantees found that patients recruited for the purposes of conducting research on a behavior change intervention differed from the patients who would be clinically appropriate to receive the intervention. For example, in a study that encouraged clinicians to engage in goal-setting discussions with patients with cardiovascular risk, action plan forms were placed in front of the chart of study patients, thereby prompting clinicians to have goal-setting discussions during those study visits. One grantee stated, “This was an unnatural intervention, since goal-setting discussions only make sense when the clinician and patient decide during the visit that such a discussion would be worthwhile.” Even with this disconnect between study subjects and clinically appropriate patients, the research did stimulate practice improvement because clinicians learned how to engage in goal-setting discussions with their patients.

Practice Recruitment Issues
The design of research studies can engender conflict between research and improvement goals. When PBRN practices, rather than clinicians or patients, are randomized, some practices endure the disruption of enrolling patients without the benefit of a practice-improving intervention. As a result, one P4H grantee reported “depression and anger in control practices.” Another grantee decided not to design a trial with control practices because such a design could interfere with the PBRN’s practice improvement agenda.

One grantee provided health behavior interventions to a group of practices owned by a hospital system and to another group of independent practices. The hospital system told the practices to participate, resulting in a variety of responses from the positive (“I was interested in this anyway”) to the negative (“When will this be over?”). One might expect that practices coerced into participating would be less inclined to initiate
improvements than practices choosing to participate. In this case, however, the grantee stated, "At project end, all practices in the hospital system implemented some aspect of a practice improvement plan, while only 6 of 10 independent practices did so."

The choice of practices in which to conduct research and improvement activities, and the manner in which the practices are approached influence the degree of adoption of an improvement by the universe of practices that might benefit from the improvement.

**Sustainability**

How practices are approached to participate in research and improvement activities may also affect the long-term sustainability—the maintenance component of RE-AIM—of the proposed interventions. If the project is marketed as research with a beginning and an end, the practice may view it as a self-limited intervention that, in the words of one grantee, "will be over soon." If the project is explained as an improvement effort, the practice may embrace the innovation as a permanent change. A grantee offered the insight that the research team and member practices may have a "project mentality," treating the intervention as having a definable endpoint, rather than seeing it as a permanent improvement.

One sustainability issue involves placing research assistants in practices vs asking the practices to perform the behavior change interventions with their own personnel. P4H projects involving intensive behavior change counseling relied on externally placed nurse-educators, coaches, community health associates, or medical students. In such cases, practice change is less encouraged because the practice continues its old ways. On the other hand, most practices do not have personnel with time to do things in a new way. Grantees stated, "Their [practice staff's] biggest concern is how the project impacts their job and what will they be expected to do," and "Much of [a staff member's] anxiety seemed to be alleviated when I told her that a research team would come in and work with the patient intervention piece with the physician."

A project that initiated behavior change in practice staff through distribution of pedometers and initiation of competition among practice staff (hypothesizing that a motivated staff would encourage patients to adopt healthier behaviors) showed that projects can create enthusiasm rather than anxiety among practice staff, thereby enhancing the probability of permanent change.

The fact that projects are funded by grants can thwart sustained practice change. Research assistants disappear once funding stops, for example, a behavior change coach was eliminated when grant money ran out, leaving practices without the means to maintain the intervention. One grantee, addressing sustainability, suggested that trained students, rotating through practices year after year, could provide assistance to clinics over an indefinite period of time. Students have flexible schedules, enabling them to conduct research projects and assist practices while obtaining valuable experience and class credit.

Interventions that provide information and training to clinicians and practice staff appeared to align research and sustainable improvement goals. One grantee provided tools and training to help pediatric practices establish systems (1) to document body mass index or provide an interpretation of growth status at well child visits, and (2) to initiate counseling on diet, physical activity, and related behaviors. The physicians and staff members were grateful to obtain the information and tools, leading to improved management of their patients.

Another grantee trained physicians in a new and sometimes threatening paradigm, by which physicians were asked to work in a collaborative fashion with patients rather than in the traditional mode of physicians telling patients what to do. This grantee noted more resistance to physicians taking on the new paradigm as a permanent practice change.

**DISCUSSION**

Applying the 5 RE-AIM components to projects in PBRNs may assist in harmonizing the research and practice improvement goals of the projects.

- **Reach:** If research studies can be designed to avoid enrolling and consenting patients, they may affect a larger and more representative sample of the general population.
- **Efficacy/effectiveness:** Studies of practice improvement interventions that deviate as little as possible from the day-to-day realities of clinical practice shift the research toward the effectiveness pole of the efficacy/effectiveness continuum.
- **Adoption:** In the majority of the P4H projects, practices were asked to participate; random sampling of practices was not undertaken. Practices that volunteer are more receptive to sustaining an intervention than randomly sampled practices; however, limiting improvement projects to practices that volunteer reduces the breadth of adoption of practice improvement.
- **Implementation:** Some of the examples presented above suggest that research studies may fail to encourage a practice to implement the research intervention, particularly if the intervention is carried out by external research assistants and if the project is marketed as a limited research effort.
- **Maintenance:** The on-again, off-again nature of research funding undermines the maintenance (sustain-
ability) of a practice improvement intervention over time. Mechanisms put into place at the beginning of a research or practice improvement project—for example, using students who continue to work in the practice year after year—could increase the chances of interventions being sustained.

CONCLUSIONS

Practice-based research has the potential to bring quality improvement into primary care practices, to train and assist practices to adopt these improvements, and to evaluate how the improvements are working for practitioners, practice staff, and patients. Research and practice improvement can be natural partners, with research acting as a facilitator of practice change.

How the research is conducted, however, matters a great deal. Some of the examples cited above are emblematic of pitfalls that can turn facilitators into barriers. Research projects with dual goals—the generation of knowledge and the improvement of practice quality—must try to avoid these pitfalls. The RE-AIM construct can be used as a checklist in designing projects in which research truly serves as a facilitator of practice improvement.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S28.

Key words: Research; practice improvement; behavior change; primary care; practice-based research

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Integrating a Health Coach into Primary Care: Reflections From the Penn State Ambulatory Research Network

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PURPOSE

In our Promoting Healthy Behaviors in Primary Care project, we proposed to (1) develop a health coach model of behavior change, integrated into primary care practices to improve diet and increase physical activity among obese adults, and (2) evaluate the effectiveness of a motivational program delivered by the health coach to assist patients in improving their unhealthy behaviors.

METHODS

In 4 family practice sites, the nursing staff and clinicians were asked to identify patients who were obese (body mass index >30) and invite them to participate in a program that would offer a personalized approach for addressing poor diet, physical inactivity, or both. Potential study patients were referred to an on-site health coach who (1) described the project and obtained informed consent, (2) collected baseline demographic and lifestyle data, (3) gave My Healthy Habits Journal to each participant, (4) provided regular follow-up to enrollees, (5) offered additional educational materials on motivation, diet, and physical activity, and (6) when appropriate, linked patients to community resources. The lay health coach provided follow-up support via face-to-face visits, e-mail, telephone contacts, or some combination thereof on average every 2 to 4 weeks for up to 6 months. At the close of the study, participants were asked to complete a follow-up questionnaire and exit interview. The intervention focused on patients working through My Healthy Habits Journal with the health coach to develop an individualized action plan to address poor diet, physical inactivity, or both. This motivational enhancement approach proposed by Miller and Rollnick and Botelho is largely based on motivational interviewing (MI). MI is "a directive, client-centered counseling style for increasing intrinsic motivation by helping clients explore and resolve ambivalence." It is based on 5 guiding principles: expressing empathy, developing an awareness of the discrepancy between the patient’s present state and his or her goal, “rolling” with the patient’s resistance to change, avoiding arguments, and supporting self-efficacy.

The initial 4-week training program for the health coach consisted of review of videotapes, reading assignments, a self-change project, and practice sessions with 2 patient participants. The trainer reviewed audiotapes of the practice sessions and provided feedback via telephone and e-mail. Once participant recruitment began, ongoing training through review of audiotaped interactions was by telephone, e-mail contact, or both every 1 to 2 weeks between the health coach and trainer. In the latter stages of the project, the transcribed audiotapes were rated using the Motivational Interviewing Treatment Integrity (MITI) scale. The MITI scale counts therapist behaviors that are important to MI, such as validating the patient’s feelings, asking open-ended questions, and listening reflectively. It also counts behaviors that do not adhere to MI, such as directing or persuading the patient, and giving unsolicited advice.

LESSONS LEARNED

Use of this model of an on-site health coach trained in motivational techniques led to 44 (48%) of the 92 patients initiating a behavior change in eating habits, physical activity, or both. Most patients preferred face-to-face meetings to telephone or e-mail contacts. Review of the audiotapes, exit interviews, and e-mail communications between the health coach and patients revealed a positive, supportive exchange. Staff at each practice site unanimously expressed the energizing impact of the health coach on patients and staff. Through involvement in the project, many office staff became enthusiastically committed to their own personal healthy lifestyle behavior change.

Our study suggests that health coaches require careful caseload management and structured guidelines to address setting boundaries. Boundary issues arose
because of the frequent occurrence of psychosocial issues including depressive symptoms in this population of obese adults. Many patients readily divulged their deeply personal struggle surrounding their eating habits. In turn, the health coach often struggled with how best to address these consuming psychosocial issues. In the future, further attention should be given to recognition of the many psychosocial complexities that compete with facilitating behavior change. In addition, firm boundaries must be set as to what the health coach can address and how much time is spent with patients who are not actively modifying their unhealthy behaviors.

Central to this project was the effective implementation of motivational techniques by the lay health coach. Although we did not directly examine what characteristics are needed to be an effective health coach, the individual must possess strong negotiating and listening skills and the capacity to project a nonjudgmental, supportive presence. The rate of adoption and implementation of the motivational enhancement techniques by the health coach depended on the particular technique and its difficulty. Learning to ask open-ended questions was relatively easy, whereas decreasing the number of closed-ended questions was more difficult. Similarly, validating the patient’s feelings and providing emotional support were easier to master, whereas decreasing the use of persuasion and direct advice took longer to adopt. The rate of uptake of the skills necessary to be an effective health coach probably varies depending on the coach’s baseline skills and personal style. For the more difficult skills, 9 to 12 months was required to master their use. Unfortunately, the literature on MI does not provide guidance on length of time required to master all the skills. In teaching MI to mental health or addiction counselors, the use of standardized patients has been found to be beneficial. The use of standardized patients for structured practice may decrease the time required for learning these techniques. This project suggests that lay health coaches require intensive, interactive training and timely supportive feedback.

Implementation is 1 of the 5 key elements proposed by Glasgow et al9 in their RE-AIM framework for translational research. Also called treatment integrity or fidelity, implementation refers to the quality and consistency of the intervention in a real-world setting. If an intervention fails, the question arises whether the failure was due to an ineffective intervention or to inappropriate delivery of the intervention. Glasgow et al10 reported that behavioral interventions may be more difficult to evaluate because of the “inherent interactivity” that characterizes the patient and health coach relationship.

Two other issues surrounding the training of the health coach had an important impact on implementation. First, audiotaping health coach–patient interactions was an essential part of this project. Traditionally, MI training occurs in workshop format. After workshop training, self-reported knowledge increases, but newly acquired skills may not be incorporated into practice when measured at a 2- to 4-month follow-up.8,11 Continued evaluation of the intervention through the use of video or audiotape is a valuable way to monitor the training process and ensure uniformity of the intervention.

Second, during the last 3 months of the project, the adoption of a standardized measure (MITI) to evaluate the health coach’s performance was a valuable training aid. Feedback was structured around specific health coach behaviors that needed to be increased or decreased. The recently described behavior change counseling index (BECCI)12 appears to be more aligned with brief interventions and could replace the MITI as the instrument of choice to measure the delivery of motivational enhancement techniques.

CONCLUSIONS

An important lesson learned from this pilot project was that brief motivational enhancement techniques provided by a lay health coach could be successfully implemented in the primary care setting. To ensure that health coaches deliver the intended behavioral interventions, training must be carefully planned and monitored. Further research is needed to determine the optimal teaching strategies that will enhance the integration of motivational enhancement techniques into practice.

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Key words: Practice-based research network; health behavior; health promotion; obesity; motivation


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References


Wellness for a Lifetime: Improving Lifestyle Behaviors of Low-Income, Ethnically Diverse Populations

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PURPOSE

Eight community nursing centers (CNCs) belonging to the Midwest Nursing Centers Consortium, a practice-based research network, implemented a community-based, multidimensional strategy to promote behavior changes among high-risk, ethnically diverse, low-income adults. The purposes of this study were (1) to promote increased physical activity levels and improved nutrition among CNC clients, and (2) to assess clinician evaluation and referral behaviors regarding clients’ physical activity and nutrition. This article describes key lessons learned from this study.

METHODS

The study used a time-series design across the 8 CNCs. The study was grounded in a community-based, public health framework, thus encouraging community outreach for participant recruitment. Clients were recruited for a 16-week course titled Wellness for a Lifetime. The course materials were based on a 10-week pilot project recently completed by one of the CNCs. These materials, developed by a multidisciplinary team using health behavior theory1 and culturally appropriate content, were provided to each CNC and outlined didactic course content, as well as themes used for discussion during the support group sessions. Didactic topics included food categories and nutritional content; principles of stretching and exercising; relationship of disease, such as hypertension, to diet and activity; and methods of stress reduction. Participants practiced safe exercises and used workout plans and walking routes. Support sessions included discussion of challenges and successes related to behavior changes, as well as field trips to fast-food restaurants and grocery stores to learn how to determine the nutritional content of a variety of food items.

Data were collected and analyzed from (1) chart audits (preintervention and postintervention) to assess change by advanced practice nurses (APNs) in documentation of assessments and in referrals for clients’ nutrition and physical activity; (2) end-of-program telephone interviews of APNs at the 8 sites to identify barriers to recruitment and retention, and strengths of the program from the clinicians’ point of view; (3) weekly and end-of-course participant satisfaction surveys that included self-
ensuring consistent data gathering and interventions. For example, fewer participants were recruited by CNCs that used a more traditional primary care model, wherein the community of service is narrowly defined as registered clinic clients and the point of entry to service typically occurs at clinic registration. CNCs were more successful in recruiting clients (1) when they were housed within community-based organizations and the point of entry for services was determined by community residents, and (2) when service provision routinely included a primary prevention focus in addition to traditional primary health care. Although all clinicians, and thus recruiters, for this study were APNs, their style of work was necessarily related to the practice milieu for their CNC. Those who were in a traditional primary care setting, whether in a freestanding community or hospital-based location, considered potential participants as they came to the center for care. Those APNs who were in nontraditional settings, located in and integrated as a part of existing community-based organizations, such as local neighborhood centers, anticipated that potential clients would be coming to the site for a variety of reasons, for example, to use a food bank, clothing closet, or daycare center at the facility, which expanded the pool of study clients at these CNCs.

A second lesson learned was the need to consider the possibility of continuing these services beyond the designated 16-week project time frame. The success of the project across the sites created an overwhelming response by the communities to continue the services long term. The community-based CNCs, where services are continuous and a great emphasis is placed on the coordination of all health and health-related services (encompassing primary, secondary, and tertiary levels of prevention), would be more able to continue, for example, a weekly session on healthy diet and physical activity as part of their standard programming. CNCs using a more traditional primary care model, wherein the individual is seen as the unit of service and services are seen as episodic, would be less able to continue an “additional” education program, such as Wellness for a Lifetime.

A third lesson learned involved the challenge of ensuring consistent data gathering and interventions across 8 sites in 5 states to obtain comparable data for analysis. Although the Wellness for a Lifetime manual was used consistently across the sites, each site’s nurse-educator modified her approach based on the specific needs of the population (eg, Spanish-speaking groups, elderly groups). Ongoing video-teleconferences, telephone, and e-mail consultations were necessary for communicating across geographically distant sites, but were not sufficient to ensure true reliability. It would have been preferable for the principal investigator, the project director, or both to visit all study sites periodically to ensure greater reliability and validity of study implementation. Ideally, visits should take place before and during the intervention period on a regularly scheduled basis.

LESSONS LEARNED

CNCs provide a model of primary care delivery that merges traditional medical management with primary prevention and community-based health promotion strategies.1 One important lesson learned with this study was that CNCs vary considerably in their delivery of primary care. For example, fewer participants were recruited by CNCs that used a more traditional primary care model, wherein the community of service is narrowly defined as registered clinic clients and the point of entry to service typically occurs at clinic registration. CNCs were more successful in recruiting clients (1) when they were housed within community-based organizations and the point of entry for services was determined by community residents, and (2) when service provision routinely included a primary prevention focus in addition to traditional primary health care. Although all clinicians, and thus recruiters, for this study were APNs, their style of work was necessarily related to the practice milieu for their CNC. Those who were in a traditional primary care setting, whether in a freestanding community or hospital-based location, considered potential participants as they came to the center for care. Those APNs who were in nontraditional settings, located in and integrated as a part of existing community-based organizations, such as local neighborhood centers, anticipated that potential clients would be coming to the site for a variety of reasons, for example, to use a food bank, clothing closet, or daycare center at the facility, which expanded the pool of study clients at these CNCs.

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CONCLUSIONS

Health disparities experienced by populations served by CNCs warrant continued community-based primary health care research. From this study, we know that research plans must take into consideration the model of health care delivery of CNCs to ensure sufficient subject recruitment and retention. Also, community-based primary health care research is relatively new, with few tested instruments and with clinicians, staff, and subject populations generally unfamiliar with the research process; this fact requires great attention to detail to ensure that study is reliable and valid that the results are generalizable. Multisite studies in primary health care require strong commitment from the health care community, sufficient funding for research support, and most importantly, collaboration with community residents to achieve successful outcomes.

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References


Purpose

Guidelines for the prevention of childhood overweight and obesity call for annual assessment of nutritional status and counseling on healthy lifestyles. This pilot study tested an office systems change approach to engage practices in applying methods for rapid identification and documentation of nutritional status, and methods for assessment of and counseling on family dietary and physical activity patterns. This article presents lessons learned from parent focus groups that reviewed proposed handouts to be used by clinicians to promote healthy dietary and physical activity habits for families.

Methods

The project applied a practice systems intervention and cross-sectional evaluations at preintervention and postintervention periods to measure office systems processes, care delivery, and parental responses to care delivery. The intervention focused on the education of clinicians and staff regarding assessment of the nutritional status of children and implementation of the routine use of tools (growth charts, chart prompts, and handouts) to promote the assessment and counseling process. The project was conducted in 4 diverse pediatric practices belonging to the Pediatric Practice Research Group, a Chicago-based primary care research network. Two practices served low-income clients, and the other 2 served privately insured patients.

Culturally sensitive, age-appropriate handouts were developed to guide and reinforce counseling recommendations for health supervision. A team of nutrition experts developed basic handout models including advice on parental modeling, physical activity, dietary practices, and television viewing. Seven handouts specific to age-group and nutritional status (underweight or normal weight/overweight) were developed and discussed in the focus groups. Handouts that discussed children younger than 2 years included sections on development and feeding. Handouts for older children and their parents had 4 sections. The first section encouraged parents to be active (eg, take the stairs or walk to the store) with their children and to model a healthy way to live. The second section focused on the child’s physical activity and included suggestions on ways to be active in the home and community. For underweight children and younger children, this section was titled “Get Moving Every Day!” For the older children who were not underweight, this section was titled “Get Sweaty Every Day!” A goal of 20 to 30 minutes of daily active exercise for children aged 6 years or older was recommended. The third section was titled “Turn Off the TV!” It called for limiting television and computer time to 1 to 2 hours per day. The final section was titled “Eat Healthy as a Family!” and focused on meal structure and dietary content.

We used 3 focus groups, including low- and middle-income English- and Spanish-speaking black, Hispanic, and white parents, to assess reactions to the proposed handouts. The focus groups’ comments were audiotaped, transcribed, and reviewed for content. Two members of the nutrition team categorized focus group responses and presented these to the research team, which later revised the handouts accordingly (the revised versions can be found at http://www.childrensmdrc.org/pprg/resources).

Lessons Learned

Parents thought that handouts provided needed information, but that achieving some of the suggested behaviors would be difficult. Parents stated, “This talks about how it’s supposed to be … but me as a parent, it’s not like that,” and “Eating as a family is like the...
Parents wanted dietary information specific to their child’s needs. They suggested including items such as “Ask your pediatrician how many calories your child should have,” or “Ask your pediatrician what is a good balanced meal according to each child’s needs.” Parents liked the idea of presenting “quick ideas, for example, start a day with a bowl of cereal.” Parents believed that handouts were a starting place for clinician instruction and that personalization to the individual family and child was necessary.

Parents were hesitant about recommendations to limit TV viewing and computer use, in part because they believed that some TV and computer use is educational and useful for getting general information. Parents thought that the suggestion to limit television viewing to 1 to 2 hours per day was too restrictive. One parent stated, “Getting the children into other activities is difficult. Children want to watch more television. They don’t want to go outside.” Also, parents reacted to “limiting screen time” by suggesting separating the recommendation of computer and television time. Parents perceived that there is a beneficial educational component in TV viewing, as supported by research.4 “There are some times when computer is educational and for homework,” one parent said. Parents preferred that “a suggestion will be limit the time and the type of programs.” There are no published reports of parental responses to clinical guidelines to limit television-viewing time for children.9 Further examination of parental response in this area is needed with revisions of guidelines to account for the inclusion of media methods in the educational process.

**CONCLUSION**

Parental responses to handouts promoting healthy dietary and physical activity habits revealed the complexity with which recommendations can be interpreted and, for some topics, disbelief that such recommendations are possible or wise. Clinicians will need to interpret health behavior recommendations in light of parental beliefs and provide suggestions for small steps for behavior change. Counseling strategies for parents and children are likely to differ, and ways to effectively counsel both parties jointly need to be explored.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S37.

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References


The Action Plan Project:
Discussing Behavior Change in the Primary Care Visit

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CONFLICTS OF INTEREST: none reported

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PURPOSE

Often, clinicians fail to discuss health-related behaviors during ambulatory visits. An action plan is a structured tool that may assist clinicians in initiating such discussions.

An action plan is an agreement between a patient and a caregiver that the patient will attempt a concrete, specific behavior change; for example, a patient may choose to walk twice around the block after lunch on Mondays, Wednesdays, and Saturdays. Action plans are designed to accomplish a small behavior change with a high likelihood of success rather than a large change that is difficult to achieve. According to several studies, when patients can achieve a small success, their self-efficacy (self-confidence in the capacity to make positive lifestyle changes) increases; self-efficacy has been correlated with improved health-related behaviors and clinical outcomes.

The objective of the Action Plan Project was to determine the following: (1) whether primary care clinicians would use a new method—the “action plan discussion”—to encourage patients to set goals for health behavior change, (2) whether this new method could be successfully accomplished in the 15-minute primary care visit, (3) whether clinicians found the method to represent an improvement over previous behavior change discussions with their patients, and (4) whether patients would adhere to their behavior change goals.

This preliminary paper summarizes the methods used to investigate these questions and some lessons learned. Detailed results are forthcoming.

METHODS

Forty-three primary care clinicians at 8 primary care sites (4 safety-net clinics and 4 private practices) in the San Francisco Bay Area participated in the project. Clinicians received a 45- to 60-minute training session to describe the intervention and intervention tool—the
action plan form (available at: http://www.action-plans.org). The training consisted of a brief review of self-efficacy theory, the demonstration by the research team of a mock action plan discussion, and action plan role plays by the clinicians being trained. Details of the training are available from the corresponding author.

Adults with risk factors for coronary heart disease were invited to meet with a research assistant before a visit with their clinician. Patients who agreed to participate completed a previsit questionnaire asking about their readiness to make a change in health-related behavior and their level of confidence that they could make a behavior change. The Action Plan form was then placed on the front of the patient’s chart to remind the clinician to engage the patient in an action plan discussion. The research assistant contacted the patients 2 to 3 weeks and 6 months after the action plan discussion to determine whether patients recalled their action plan and the extent to which they were able to achieve their behavior change goals. Clinicians filled out a brief questionnaire immediately after each action plan discussion and at the end of the project.

LESSONS LEARNED

The results of clinician questionnaires completed at the end of the project indicated that the majority of clinicians found the action plan concept helpful as a guide to discussing behavior change with their patients. The major barrier to initiating action plan discussions with patients was lack of time in the multiagenda primary care visit.

Most patients, when called by telephone 2 to 3 weeks after the action plan discussion with their clinician, remembered their action plan and reported attempting to initiate behavior change based on the action plan. Most patients appreciated the follow-up telephone call. Six-month follow-up data are not yet available.

The major encouraging lesson of the project is the overall positive reaction of both clinicians and patients to the action plan idea. The major discouraging lesson is that action plan discussions are not feasible for clinicians to undertake as a regular feature of the busy primary care visit.

This project also provides a lesson concerning the relationship between research and practice improvement. The 8 practices participating in this study were approached to participate in a research study of limited duration. The practices were not asked to engage in a permanent practice improvement project to increase the quantity and quality of discussions about healthy behavior change with patients. All the time and effort going into the project were placed on the shoulders of research assistants (who disappear once the research is completed) and clinicians (who are unlikely to continue to hold action plan discussions because of lack of time).

Were we to do this project again, we would try to engage the practices in a sustainable improvement project rather than a temporary research study. We would attempt to train nonclinician practice personnel in conducting action plan discussions with patients, and to help the practices find a way to continue these discussions as a permanent feature of their clinical work.

CONCLUSIONS

The take-home lesson from this project can be formulated as follows: behavior change discussion with patients using action plans is a desirable addition to the primary care enterprise, but primary care clinicians cannot be expected to add these discussions to an already overfilled plate of responsibilities. Other caregivers thus need to be trained and given time to engage in action plan discussions with patients—in consultation with the patients’ clinician—and to initiate follow-up contact with patients regarding their action plans. It is essential to engage practices in this improvement process at the very beginning of the project.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S39.

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References

Practice Extenders and PDA-Based Counseling for Smoking and Unhealthy Diet

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PURPOSE

Members of the Alabama Practice Based Research Network (APBRN) explored the feasibility of using personal digital assistants (PDAs) as a means of integrating into routine clinical practice brief, evidence-informed interventions following the 5 A’s model for assessment and counseling of behavioral health risks (ask, advise, assess, assist, arrange).1-3 Practice extenders (PEs) were used to augment the assist and arrange steps and to support patients’ efforts to change unhealthy behaviors.

METHODS

Eight family physicians in 5 practices located in and around Birmingham, Ala, delivered PDA-based 5 A’s behavioral smoking and obesity interventions to more than 200 male and female adult patients during routine clinic visits over a 9-month period. The physicians and PEs (1 assigned to each practice) were trained in the study protocol. Graduate student research assistants fulfilled the PE role for this study, receiving specialized training in smoking cessation and dietary modification, as well as in methods of health promotion and disease prevention counseling, including motivational interviewing.

The PDA-based interventions, which included a data collection and referral mechanism, were created using Pendragon Palm OS database software (Pendragon Forms, Pendragon Software Corp, Libertyville, Ill). With content grounded in clinical practice guidelines,1,3 the interventions prompted physicians through the 5 A’s steps at the point of care. Value-added features (eg, automatic body mass index and Fagerstrom score calculations, behavior modification tips) allowed for the personalization of each intervention, which is known to be important in encouraging patient compliance. Patients who indicated readiness to change at the assess step were informed of the availability of PE services. Physicians obtained and recorded consent on the PDA. Data collected during interventions were automatically transferred to a secure off-site server when the PDA was synchronized with the physician’s desktop computer, then retrieved at the APBRN Coordinating Center at the University of Alabama at Birmingham. Offices could also alert PEs by fax that a patient had requested assistance.

On initial telephone contact, PEs confirmed patient interest and worked with patients to develop plans for the behavior change. They mailed personalized packets containing a printout of the plan, self-help materials, and information on free or low-cost community-based resources. PEs conducted telephone follow-up 1 week and 1 month after the change date, and were available for telephone support between scheduled contacts. After the 1-month follow-up, the PEs provided progress reports to the physicians.

Outcome measures included physician adherence to the study protocol, patient consent to PE contact, delivery of PE assistance, and patients’ self-reported behavior change. End-of-study qualitative review with the physicians and PEs provided further insights related to feasibility, utility, and sustainability of the system and its potential to affect patient outcomes.

CHALLENGES AND LESSONS LEARNED

The Chronic Care Model, with its 6 elements (community resources and policies, health care organizations, self-management support, delivery system design, decision support, and clinical information systems), has been recommended as a template for improving preventive services and for effective chronic disease management.4 Our study embraced all components of this model.
In a previous study, APBRN physicians reported positive responses by patients to their use of PDAs during clinical encounters; no objections arose during the current study. Design limitations of the software used (Pendragon Forms), specifically limitations related to formatting and navigation options, made functionality of the PDA protocols less than optimal, but compared with other products, this software was still best suited to support the decision trees. Development and testing of the intervention programs proved arduous, but the software operated smoothly once deployed. Between the discontinuation of Pendragon’s database-hosting services and the need to upgrade the software (to version 4.0) to enable interfacing with a new off-site server, programs created in the previous study had to be rebuilt. Without in-house information technology expertise, these technical challenges would have been considerable.

Installation of the hardware and software necessary to establish server connectivity at the practices was time intensive. Each system had to be configured individually, and this task involved circumnavigating firewalls to allow for data transfer without compromising security, which required advanced information technology support. Logistics and compatibility issues prevented the printing of data directly from the PDA at the time of contact, which would have enhanced the intervention’s “teachable moment” and been valuable for documenting information in the chart and follow-up. Once established, the system functioned smoothly, with the only barriers encountered being those related to human error (e.g., physicians forgetting to charge or synchronize the PDA).

Despite high initial enthusiasm and thorough training, buttressed by ongoing communication and site visits, physician compliance with the study protocol decreased with time. This waning compliance was primarily due to competing practice demands and lack of incentives, but also to characteristics of the study design. Although the protocol was fairly simple, using 2 separate PDA-based interventions addressing 2 distinct health issues and simultaneously working with PEs proved challenging for physicians and staff. This study demonstrated that consistent use of behavioral interventions cannot be guaranteed given competing demands on practices’ time and energy.

Of the more than 200 patients who received a PDA-based intervention to address smoking or unhealthy diet and were ready to change their behavior, most (56%) availed themselves of PE support. Although this study was able to accommodate patients who requested PE contact outside of business hours, this level of personal support would not likely be available in the clinical setting. Whether successful in changing their behavior or not, many patients expressed the value of having someone who cared enough to make an effort to help, referring to the PE as well as their physician.

 Physicians received unsolicited positive feedback from patients who were successful in changing their behavior and who attributed their success in part to support, information, or both received from the PEs. Because of logistical and practical considerations, research assistants fulfilled the PE role for this study. In addition to orientation to the study protocol, they required specialized training in the target behaviors. Although PEs may aid busy physicians in implementing the assist and arrange steps and increase the likelihood that patients will act on physicians’ advice, their feasibility and sustainability within the current primary care clinical setting remain to be determined.

PEs referred the patients in this study to national toll-free help lines, Web sites, and community-based self-help programs for smoking cessation and weight loss, emphasizing the use of free or low-cost resources to aid patients’ behavior change efforts.

**CONCLUSIONS**

PDA-based behavior change interventions may be an accessible, relatively low cost and easy-to-use tool that can be integrated into everyday practice, but only if consistent with physicians’ priorities. PEs may be a valuable adjunct to traditional care and enhance patient compliance with physicians’ recommendations, but integration of such services into the current health care model would likely require changes in systems. A PDA-based behavior change intervention and referral system nevertheless has the potential to be successfully implemented in the clinical setting.

**Key words:** Computers, handheld; smoking; diet; obesity; practice extenders; health care delivery/health services research; health promotion/disease prevention; practice-based research; research capacity-building

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References

Bringing the Behavioral Health Improvement Program (BeHIP) to Rural Kentucky

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PURPOSE
Cost-effective strategies for assisting patients in behavior change are needed at the primary care level. The purpose of this project was to determine the feasibility and effectiveness of linking rural practices with an established telephonic counseling service housed at an academic medical center.

METHODS
We enrolled 32 rural primary care clinicians (14 practices) from the Kentucky Ambulatory Network and educated them about the counseling services available to their patients through the Behavioral Health Improvement Program (BeHIP) at the University of Kentucky, Lexington, Ky. Clinicians referred their patients for smoking cessation or exercise counseling by giving them a prescription that was printed with the program contact information. Once patients called, their consent was obtained, and they were matched with a personal health counselor who performed behavioral assessment and staging, assisted patients with goal setting, and scheduled telephonic follow-up. All protocols were approved by the University of Kentucky's Institutional Review Board. An overview of the counseling program for sedentary lifestyle is presented in Table 1.

LESSONS LEARNED
One lesson learned was that rural primary care clinicians were eager for external resources that can assist their patients in behavior change, and were willing to refer their patients to such programs. Of the 34 clinicians initially contacted, only 2 declined to participate. Clinicians received no remuneration for their time spent orienting to the program (about 1 hour) or for their time spent talking to their patients about the program or making referrals.

Of the 32 clinicians who consented to participate, 25 actively referred patients during the 8-month study
period. These clinicians generated slightly more than 3,000 referrals (based on self-report of used prescription pads). The number of referrals produced per practice ranged from a low of 10 to a high of 900, with one half of the practices referring 100 or more patients. Interviews with a sample of the physicians who did not refer indicated that their nonparticipation was driven mainly by system factors such as lost prescription pads and failure to remember the resource was available, rather than disinterest or concerns about the program’s efficacy. It also appeared that these practices failed to garner a champion for the project, that is, someone in the practice specifically identified to nurture the study. For those physicians who did refer, poststudy interviews indicated a high level of satisfaction with the program. Referring physicians made such statements as “What a great resource!” and “Can I keep referring to the program once the study is over?” Although studies indicated a high level of satisfaction, reported by BeHIP staff, was that it should be closer to 30%. This reduced ratio could be explained by a geographic effect (e.g., physicians thinking “that counseling center is quite far off”), a decrease in initial staging by the referring physician (ie, referral of more patients in the precontemplation stage than in later stages of readiness), overreporting of the number of referral prescriptions handed out (which would actually increase the true ratio), or myriad other physician- or patient-related factors. Research specifically designed to explore the decision process in this population would be needed to clarify this phenomenon further.

Of the 293 inquiries to the program, 119 patients enrolled after hearing details of the study and counseling service. Seventy-one patients enrolled in the exercise program, and 48 enrolled in the smoking cessation program. All of these enrollees have continued to participate in scheduled telephonic counseling, with 3 achieving maintenance (defined as smoking cessation for 3 months or performance of 1,000 kcal of exercise per week for 3 months) at the time these data were reported. Data from this study and previous program experience suggest that the average number of telephonic interactions needed to guide a patient to maintenance is 17. This number represents significantly more contact than most studies investigate.4,5 Such persistent participation by the enrollees in this study suggests a relatively high perceived value for the program.

More formal satisfaction and efficacy data will be collected when all participants either reach maintenance or opt to end participation in the program. A cost-effectiveness analysis is also planned pending completion of the program by all of the participants.
CONCLUSIONS

Linking a telephonic counseling program to rural primary care practices to assist patients in behavior change was well accepted and welcomed by clinicians. Once enrolled, patients seemed to value the program, but additional strategies beyond a 1-time physician referral are needed to increase patient participation.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S43.

Key words: Sedentary lifestyle; smoking; telephone counseling; community/public health; health promotion/disease prevention; behavior change; rural health services

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References

Establishing a Family-Based Intervention for Overweight Children in Pediatric Practice

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PURPOSE

We performed a pilot study in 2 pediatric practices to (1) increase the identification of overweight children by the primary care clinician and encourage their referral to an “in-office” family-based intervention, and (2) test the feasibility of an intensive family-based intervention using behavior modification to alter nutrition and physical activity in children who are overweight.

METHODS

The intervention was conducted at 2 community pediatric practices in western Pennsylvania. One rural practice, approximately 40 miles from Pittsburgh, serves a predominantly white population with low to middle income. The second practice serves a racially and economically diverse urban population in the city of Pittsburgh. Each practice has 10 physicians and 1 nurse-practitioner.

During a 90-minute interactive session, physicians were trained in the use of brief motivational strategies to assist parents in taking steps toward healthier behavior relating to nutrition and physical activity. The identification of overweight children was facilitated by introduction of routine systematic measurement and recording of body mass index (BMI), which was plotted according to sex and age on a color-coded BMI chart, resulting in visual confirmation of the degree of overweight. Physi-
Physicians used their new motivational interviewing skills to introduce and refer patients to the intervention. Children between 8 and 12 years of age identified by their primary care clinicians as being above the 85th percentile for BMI and their families were eligible.

The intervention, consisting of separate group counseling for children and parents (approximate group size = 8), was delivered over 6 months: 8 group sessions in the first 3 months and 3 individual follow-up sessions with the counselor in the next 3 months. Ten minutes of one-on-one counseling for each child-parent dyad was provided at 7 of the 8 group sessions. The intervention was delivered by behavioral psychologists, nurse-educator trainees, or both.

To learn about parents’ perceptions of their child’s weight and physical activity, and their concern about these issues (in preparation for the clinicians’ motivational interview), we gave a 7-item questionnaire to parents of all children between 3 and 12 years of age being seen for a health maintenance visit. The questionnaire, completed in the waiting room, asked parents to indicate whether their child was of normal weight or overweight.

We performed the following activities to determine outcomes: (1) assessment of documentation of the recording of BMI in the medical record, (2) exit interviews conducted with parents before and after the intervention was implemented to assess whether physicians discussed BMI as part of their routine feedback to parents, (3) assessment of physicians’ self-reported confidence in the use of counseling skills related to overweight as determined by a questionnaire administered before and after the intervention, and (4) tracking of family attendance at group intervention sessions.

**LESSONS LEARNED**

The 2 practices that were sites for this pilot study were selected because of their size, patient composition, and general interest. Physicians and office staff were very interested in developing skills to help solve the problem of obesity in children. A questionnaire completed by 21 physicians before and 2 months after their skills session showed a notable increase in physician confidence with regard to counseling about nutrition and weight status. Informal discussions with physician participants indicated a desire for more “practice” sessions. Nurse-practitioners and staff members (nursing assistants) displayed their interest in the intervention program by volunteering to be trained to lead the parent and child group, respectively.

A chart audit conducted in both practices indicated that the introduction of systematic measurement and recording of BMI was easily accomplished. A color-coded BMI chart used to illustrate the child’s BMI was placed in the medical record, and a miniature copy was provided to the parent. Exit interviews with parents conducted before (24 interviews) and after (27 interviews) the training sessions for primary care clinicians and the introduction of the color-coded chart showed a substantial increase in the discussion of eating habits and physical activity.

Responses on the questionnaire indicated that parents of young children (3 to 5 years of age) who were overweight rarely recognized that their children were overweight (Table 1). Likewise, parents of children at risk for overweight (>85th but <95th percentile) infrequently acknowledged that their children were above the usual standards for weight. Accurate parental perception of overweight in children was most often noted in older children (8 to 12 years of age), more often in girls than in boys, and more often in those with the highest BMI. Ninety-three children had a BMI between the 85th and 94th percentile and were classified as at risk for overweight. Only 7 (7.5%) of 93 mothers identified their children as above normal weight, compared with 70 (49.3%) of 142 mothers of children in the 95th percentile or higher.

Use of office staff to lead a behavioral intervention requires further study. Identification and training of appropriate individuals are very time-consuming, and there is uncertainty regarding whether the “train the trainer” model will be sufficient to produce generally effective results. Practical issues emerge, such as the need to train additional individuals as backup for unexpected absences (eg, illness and moves).

Thirty-seven (50.5%) of 73 families who began the intervention completed at least 6 of 8 group sessions and 1 of 3 follow-up sessions. This program required a large time commitment and a change of habits on the part of the parent to create a successful environment for the child. It also required that all caregivers in the child’s home be congruent in their appreciation of the problem and committed to its solution. If any household member was not supportive, it was

<table>
<thead>
<tr>
<th>Age</th>
<th>Boys % (No.)</th>
<th>Girls % (No.)</th>
<th>Total % (No.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-5 y</td>
<td>12.5 (3/24)</td>
<td>25 (4/16)</td>
<td>17 (7/40)*</td>
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<tr>
<td>6-8 y</td>
<td>32 (6/19)</td>
<td>60 (15/25)</td>
<td>48 (21/44)</td>
</tr>
<tr>
<td>9-12 y</td>
<td>35 (18/51)</td>
<td>89 (24/27)</td>
<td>72 (42/58)</td>
</tr>
<tr>
<td>Total</td>
<td>29 (27/94)*</td>
<td>63 (43/68)*</td>
<td>137 (70/142)</td>
</tr>
</tbody>
</table>

BMI = body mass index.

* P < .001 (boys vs girls).
† P < .001 (younger children vs older children (7/40 vs 63/102).
INTERVENTION FOR OVERWEIGHT CHILDREN

extremely difficult to create a successful environment. Families discontinued participation for a variety of reasons. If we can identify these reasons prospectively, we may be able to discourage some patients from beginning the intervention until potential barriers are resolved. It is desirable to delay participation of a family until there is a greater chance for success.

CONCLUSIONS

Pediatricians and their office staff were very interested in strategies to help identify and treat children who were overweight. Systematic identification of overweight children was easily introduced into the practice setting. Parents of young children (3 to 5 years old) who are overweight and of children at risk for overweight infrequently recognize that their children are above the usual standards for weight. Accurate parental perception more often occurs in older children, in girls, and in children with the highest BMI. An in-office family-based intervention focused on behavior modification can be successful if barriers are identified and reduced.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S45.

Key words: Overweight; obesity; parents; child; pediatrics; primary care; nutrition; behavior modification; diet; physical activity

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It Takes a Partnership: The Value of Collaboration in Developing and Promoting a Web Site for Primary Care Patients

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PURPOSE

The purpose of our project was to develop a specialized Web site that helps patients pursue healthy eating, physical activity, smoking cessation, and moderation of alcohol consumption, and to integrate use of the Web site into primary care practice.

Encounters between patients and clinicians are a unique opportunity to promote healthy behaviors. Patients cite the advice of their physician as an important motivator for lifestyle change.1 Unfortunately, health care professionals are often ill-equipped to deliver the intensive counseling that is necessary to effect sustained behavior change. Among the various barriers—which include inadequate time, reimbursement, and counseling skills—are the limitations most clinicians face in helping patients obtain the information they need for behavior change.2,3

To address these information needs, we worked with 6 primary care practices within the Virginia Ambulatory Care Outcomes Research Network (ACORN) to develop a Web site that patients could use at home to identify risky behaviors and enjoy convenient personal access to the best local and national resources on healthy behaviors. We aimed to both develop and evaluate the Web site within the 16-month grant period. The Web site’s effectiveness was assessed with a pretest-posttest design, the results of which will
be reported elsewhere. This article describes our experience in using a collaborative model to rapidly develop the Web site and promote its adoption.

METHODS
The My Healthy Living Web site differs from existing Web sites by combining 6 attributes: it is patient-centered, comprehensive, stage-tailored, evidence-based, user-friendly, and integrated into primary care. First-time Web site users answer a series of questions that assess health behaviors and stage of change. The Web site presents a portfolio of 200 local and national resources, tailored to individual health habits and readiness to change, which includes general information, tips, tools, resources for local support, information on special issues, and links for further assistance. It also provides individualized counseling messages and the option to print summary reports.

We used collaborative strategies to broaden input into the design of the Web site and to promote its implementation.

To develop our Web site, we sought input from 5 sources:
• Practices: The clinicians and staff who would later participate in the study were first engaged to help write the grant. Once the study was funded, we used existing office management infrastructures and 2 site visits at each practice to solicit input on the basic Web site concept, practice needs, perceived Web site value, study feasibility, and Web site promotional strategies. More than 90 physicians and 180 staff from the study sites gave input.
• The community: Four local partners assisted with identification of relevant community resources to post on the Web site. These partners comprised a local hospital system, a cancer center, a county park authority, and an alcohol treatment center.
• Experts: We engaged several behavioral scientists to help design the patient behavior questions and a framework to link resources with reported stage of change. A Web site programmer and database designer built the site’s architecture. Graphics artists helped to make the Web pages attractive.
• Users: We beta-tested the Web site with mock users to identify problematic site features and to clarify the wording of questions.
• National organizations: We sought advice from 10 federal agencies, specialty societies, and voluntary health organizations. In telephone conferences and follow-up surveys, we asked these partners for input on study design, their organization’s best resources to post on the Web site, and assistance in raising awareness about our project.

We had only 12 months for study enrollment and Web site assessment. We undertook 3 steps at the practices to ensure swift and sustained promotion of the Web site:
• Cementing practice buy-in: We conducted 2 site visits at each practice not only to obtain input, but also to foster clinician and staff acceptance of the Web site through an instilled sense of ownership. At each site, we identified 3 “champions” (a physician, a nurse, and an office manager) to promote the project and troubleshoot problems. We also e-mailed bimonthly newsletters to maintain study engagement.
• Promotional materials: Guided by advice we received from practices, we developed strategies to optimize patient awareness of the Web site. A graphic artist designed attractive posters to display prominently in lobbies and examination rooms. Tear-off pads on the posters enabled patients to bring the details home. Prescription pads containing similar information were distributed to clinicians. We mentioned the Web site on telephone hold line messages, health reminder fact sheets, and directions for obtaining laboratory test results. We prominently placed the Web site icon on each of the practices’ Web sites. The practices took additional steps to promote the Web site: physicians and nurses personally recommended the site, and office managers ordered special stamps to add Web site information to standard patient mailings.
• In-service training: Approximately 1 month before the Web site was launched, we conducted a training session at each practice to provide a hands-on Web site demonstration and review the promotional materials that would be available.

LESSONS LEARNED
Our experience affirms the findings of others that a collaborative approach can be highly effective in designing and promoting quality improvement tools. Uptake of our Web site was immediate, and the rate of first-time patient visits persisted throughout the study period (Figure 1). Anecdotal reports from clinicians and patients were largely positive. Pending empirical data will determine whether the patients who could benefit visited the Web site in adequate numbers and whether the exposure was beneficial.

Web site users reported being directed to the site most frequently by their physician or nurse (reported by 38% and 8% of users, respectively). The enthusiasm of clinicians and staff in promoting the Web site, which the investigators observed directly, may reflect our efforts to engage them early in its development. These efforts cultivated clinician buy-in and Web site endorsement, and our efforts to familiarize them
with the content may have helped clinicians identify patients most likely to benefit. We conjecture, but cannot confirm, that the resulting clinician and staff enthusiasm accounted for a high level of patient interest in the Web site. Indirect evidence suggests the high level of interest: early in the study, patients had exhausted the supply of tear-off pads at most practices, forcing the supply of photocopy replacements.

The promotional materials that we developed also appeared to play an important role in Web site visits. Besides clinicians, wall posters and on-hold telephone messages were the leading means by which patients learned of the Web site (reported by 17% and 12% of users, respectively).

On a pragmatic level, we learned that a collaborative approach can produce a Web site with far less time and money than are normally required to field a product of this quality. Many who have complimented us on our Web site are unaware of the shoestring budget on which it was developed. Modest resources can be leveraged to achieve high quality by engaging talent and commitment through a multidisciplinary collaborative model.

CONCLUSIONS

We succeeded in designing and promoting a Web site in primary care practices through early and coordinated engagement of clinicians and staff, community and national partners, experts, and users. A collaborative model can leverage resources and helps achieve the best product to improve the quality of care.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3(Suppl_2)/S47.

Key words: Internet; World Wide Web; practice-based research; primary care; health promotion/disease prevention

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References


Changing Organizational Constructs Into Functional Tools: An Assessment of the 5 A’s in Primary Care Practices

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PURPOSE
Primary care clinicians have a unique opportunity to identify health risks in their patients and to encourage healthy behaviors, such as smoking cessation, physical activity, proper nutrition, and moderation in the use of alcohol. Yet, even brief evidence-based interventions are inconsistently used by primary care clinicians.1 The 5 A’s model (ask, advise, assess, assist, and arrange) is a tool to assist clinicians in asking patients about their health behaviors and, if patients are found to be at risk, advising them to modify their behavior, assessing their interest in doing so, assisting in their efforts to change, and arranging appropriate follow-up.2,3 This article describes baseline data from a larger interventional study testing a nurse consultation model for improving health promotion in primary care practices, and presents the implications of moving the concept of the 5 A’s into systematic interventions for multiple unhealthy behaviors. A transition from an organizational construct to a set of evidence-based 5 A tools is essential for primary care clinicians to assist their patients with health behaviors as suggested in the Healthy People 2010 goals for the nation.4

METHODS
Practices in the study selected their own goals for practice improvement based on the 5 A’s for 1 or more of the specified health behaviors. Twenty Michigan family medicine and general internal medicine practices belonging to the Great Lakes Research Into Practice Network participated: 10 were rural, hospital-owned practices (69 clinicians), and 10 were metropolitan, largely independent practices (25 clinicians). Practices were provided several services, including determination of their current preventive care activities, identification of practice improvement opportunities, assistance with planning interventions, and support for implementation and evaluation.

Data collection methods included chart audits and nurse-consultant field notes based on practice observations and interviews with practice clinicians and staff, including their awareness and use of the 5 A’s model. A 3-month time frame was identified for the preintervention audit, and all visits by adults for chronic disease (hypertension, cardiovascular disease, diabetes) and health maintenance were selected for that period. Fifty charts per practice were randomly selected for audit, and 1 reference visit was audited per selected chart. Trained nurses conducted the chart audits using a specifically designed chart audit tool and identified guidelines for determination of each of the A’s. Relevant items from the reference visit progress note, visit-related laboratory and radiograph reports, and flow sheets were noted and copied verbatim onto the audit form. As a quality assurance measure, the principal investigator reviewed all of the chart audit forms for consistency across abstractors.

LESSONS LEARNED
From the nurse-consultant field notes, we discovered it was rare that anyone in the practice, other than the physicians, had ever heard of the 5 A’s. Most of the clinicians who participated in our study were aware of the 5 A’s as an organizational construct, but none used it as a functional tool in practice. The rate of documentation of the 5 A’s in the medical records at baseline varied by practice and by behavior (Table 1). When present, ask was usually documented on a flow sheet completed at a previous visit. Clinicians most frequently asked about tobacco use and smoking but intervened only in about one third of the patients at risk. Queries about diet were least frequently documented, but dietary interven-
DISCUSSION

The 5 A’s have been widely used in high-quality, controlled clinical trials in tobacco cessation and brief primary care interventions for a variety of behaviors.  
Unfortunately, there are few validated, functional supportive resources for screening, monitoring, and intervening for unhealthy behaviors.  
Current research also indicates that successful practice interventions involve systematic processes using multiple members of the practice team, and not just relying on the physician alone.  
This finding has important implications for the practical use of the 5 A’s tool in that practice staff members must be skilled in its use as well.

Chart audits may either overreport or underreport actual clinician behavior. Previous research shows that chart documentation often underestimates what actually occurs during the office visit.  
Had the actual intervention rates by clinicians in the present study been double those found in the medical records, however, the level of intervention for assess, assist, and arrange would fall short of the ideal. Because assist and arrange were the least frequently documented of the 5 A’s, patients who are ready to change would receive little help in reaching their goals. On the other hand, simple advice, assistance, and follow-up arrangements in the absence of an appropriate assessment of a patient’s readiness to change may not be effective in changing patient behavior. The chart audit does not capture the dynamic nature of the 5 A’s and thus may overstate the effectiveness of an intervention (ie, produce a false-positive result).

There are additional limitations to this study. The sample of practices selected for this study may not be representative of other primary care practices in their use of the 5 A’s for these behaviors. Some arbitrary decisions were made in coding each A within the 5 to maintain consistency in coding. These decisions may not reflect the true intervention delivered to the patient. Finally, these data represent documentation rates, not rates of actual delivery of services, which may have been higher or lower.

CONCLUSIONS

Despite widespread support for their use, the 5 A’s remain an organizational construct with limited practical penetration into the primary care practices in this study and most likely other primary care practices nationwide. This study suggests that practices need clinical staff with a better understanding of the 5 A’s framework, including brief assessment strategies, systematic approaches to the use of the 5 A’s supported by the whole practice team, and development of supportive resources such as chart prompts and other practical tools.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S50.

Key words: Primary care; 5 A’s; smoking cessation; physical activity; diet; alcohol drinking; practice-based research

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Table 1. Documentation of Asking and Intervention for Health Behaviors in 20 GRIN Practices

<table>
<thead>
<tr>
<th>Health Behavior</th>
<th>Mean (% No.)</th>
<th>Range*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask rate†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco use</td>
<td>81 (791/981)</td>
<td>0-100</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>57 (559/981)</td>
<td>0-96</td>
</tr>
<tr>
<td>Physical activity</td>
<td>48 (471/981)</td>
<td>0-96</td>
</tr>
<tr>
<td>Diet</td>
<td>47 (457/981)</td>
<td>0-98</td>
</tr>
<tr>
<td>Any intervention rate†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco use</td>
<td>35 (611/174)</td>
<td>0-100</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>35 (10/29)</td>
<td>0-75</td>
</tr>
<tr>
<td>Physical activity</td>
<td>72 (146/204)</td>
<td>15-100</td>
</tr>
<tr>
<td>Diet</td>
<td>85 (181/213)</td>
<td>56-100</td>
</tr>
<tr>
<td>All intervention score§</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco use</td>
<td>0.7</td>
<td>0-2.5</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>0.7</td>
<td>0-2.0</td>
</tr>
<tr>
<td>Physical activity</td>
<td>1.2</td>
<td>0-3.3</td>
</tr>
<tr>
<td>Diet</td>
<td>1.8</td>
<td>1-2.3</td>
</tr>
</tbody>
</table>

GRIN = Great Lakes Research Into Practice Network.

Note: Asking was defined as documented use of ask among all patients making visits. Intervention was defined as documented use of any A past ask (advise, assess, assist, or arrange) among patients identified to be at risk for that behavior.

* Range across the 20 practices.
† Number of patients for which ask was documented/number of patient visits.
‡ Number of patients for which any A past ask (advise, assess, assist, or arrange) was documented/number of patients identified to be at risk for that behavior.
§ Total number of A’s (advise, assess, assist, or arrange) documented per patient among patients identified to be at risk for that behavior. Possible range of scores: 0 (minimum) to 4 (maximum).
LEAP—A Brief Intervention to Improve Activity and Diet: A Report From CaReNet and HPRN

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Purpose
The purpose of our project was to test a practice-level intervention to increase use of evidence-based strategies for promoting physical activity and healthy diet by primary care patients. The intervention is based on the premise that if you create an office culture that promotes healthy behaviors among clinicians and staff, they will be more likely to provide brief behavioral counseling to patients.

Methods
Leaders in Effective Activity Planning (LEAP) was a randomized study of a multilevel intervention to promote improvement in physical activity and healthy eating through brief counseling, goal setting, and feedback. We compared an intensive practicewide intervention with a minimal intervention in 12 primary care practices within the Colorado Research Network (CaReNet, n = 8) and the High Plains Research Network (HPRN, n = 4). Randomization occurred at the practice level.

In 6 intervention practices, clinicians and staff used the behavior change tools to make their own personal changes for 1 month before using these same tools with their patients. These practices received support from change coaches—a nurse practitioner, a family physician, and a registered dietitian or health educator. Coaches helped practices encourage office-wide behavior change through group activities and pedometer use. Intervention practices received promotional items (posters, flyers, pins, and ribbons) to advertise to patients the practice members’ behavior changes and the LEAP study. The 6 control practices did not receive coaching or
promotional items, were not specifically asked to coach patients, and were provided only basic support from research staff. These practices were trained in the use of the tools and asked to immediately begin enrolling patients.

Participants received a pedometer and a short educational booklet, which was adapted for primary care office use from tools developed by Colorado on the Move, now known as America on the Move. The LEAP tools are available online. Practices were asked to screen and enroll interested patients older than 18 years using a goal-setting form. Each practice was asked to recruit up to 75 patients to reach an overall enrollment goal of 900 patients. After patients were enrolled, the intervention practices' champions were encouraged to telephone patients twice to help encourage change.

We collected 2 types of data during the 6-month study period: (1) practice-level information from qualitative interviews, field notes, and visits, and (2) information on individual participant's self-assessed progress toward goals, collected from an automated telephony system. Participants called the system to enter their goal (physical activity or nutritional) and their weekly score rated on a 4-point scale from 0 (did not work on goal) to 4 (exceeded goal). We compared patient recruitment, an important intermediate outcome indicating level of motivation to enroll patients, between intervention and control practices. This project was approved by the campus and hospital institutional review boards, and all practice personnel signed consent forms.

LESSONS LEARNED

The intervention, personal use of the LEAP tools by clinicians and staff before patient recruitment, did not improve patient enrollment or the likelihood of patients submitting any data to the telephony system; however, we encountered surprisingly high rates of participation among clinicians and staff and found evidence that these practice personnel were able to make and sustain personal changes.

Of the 271 participating practice members, 109 were in control practices (representing a 64% participation rate) and 162 were in intervention practices (86%). In our analyses of patient-level data (Table 1), patients in the intervention practices reported data for more weeks than did patients in the control practices (2.8 vs 2.0 weeks, \( P = .033 \)).

Data from interviews and field visits show that practices liked LEAP’s simple approach to improving activity levels and diet. Both groups found the tools easy to use. The intervention practices indicated that using the tools was personally rewarding, with many practice members reporting considerable lifestyle changes. In one office, 3 previously inactive staff participated in a minitrithalon. The process of working on changes together, sometimes as a friendly competition, helped members make changes. One office started a new competition after the study was over because the first one was “too easy.” Various practices’ staff members indicated they lost 10 to 15 pounds through changes they believe they can maintain. Participants found simple ways to add activity to their daily lives. For example, one practice member stated, “I park in the back of parking lots and don’t look for the close-in spot.” Another individual found ways to make small changes within her work environment, such as delivering requested items to others instead of asking them to come to her, and walking around her work area during lulls. These changes increased her daily steps from fewer than 4,000 to more than 10,000 and helped her lose weight. Overall, the intervention practice members indicated they were more aware of their habits, providing comments such as, “It opens people’s eyes to what it takes to be physically active,” and “I found out more about the kind of food I eat. It helps me be more aware and I do eat a lot,” and “The LEAP booklet gave me the options to think about the food I eat.” Practices reported that some patients also made important lifestyle changes.

Many offices have adopted the concept of making simple changes and continue to use LEAP tools; one office requested extra booklets to share with a second office in another community. All practices indicated that they would like to continue to use our booklet.

Similar to previous research, we found that a multilevel intervention involving simple behavior change tools can help practice members make personal lifestyle changes. Although the LEAP tools were successful in motivating change and helping practice members improve activity levels and diet, these positive benefits did not translate into higher patient enrollment in the LEAP study. There are several possible explanations for this finding. Both control and intervention practices expressed a need for LEAP-like tools before beginning the study and found the LEAP tools helpful and easy to use, which may have mitigated any potential differ-

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**Table 1. Patient-Level Data for the LEAP Study**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Intervention No. of Patients</th>
<th>Control No. of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening forms used</td>
<td>676</td>
<td>576</td>
</tr>
<tr>
<td>Goal-setting forms received</td>
<td>161</td>
<td>287</td>
</tr>
<tr>
<td>Any patient data entered</td>
<td>120</td>
<td>230</td>
</tr>
</tbody>
</table>

LEAP = Leaders in Effective Activity Planning.

Note: \( P > .10 \) for proportion of patients who entered data versus proportion who enrolled.

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ences in recruitment. Control practices were able to personally use the tools after completing patient enrollment, which may have motivated control practices to complete enrollment quickly. The telephony system we used for research purposes presented a barrier, decreasing our ability to detect behavior changes at the individual level. For both groups the average number of weeks participants reported data was very low because many patients reported only 1 week of data.

CONCLUSIONS

Interventions designed to fit unique interests and needs of each practice, including easy-to-use informational resources and incentives, can change behavior and promote a healthy primary care office. Personal success with behavioral change activities and practice-level enthusiasm for change did not translate to enhanced patient recruitment, however. Fitting health promotion into personal routines for clinicians and staff seemed easier than integrating LEAP tools into the routine of busy primary care practice. Although early findings suggest a very modest impact of the LEAP tools for both control and intervention patients, enhancing coaching skills and using simpler self-monitoring systems might improve the program’s impact.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S52.

Key words: Primary care; behavior change; practice culture; exercise and diet; physical activity; diet; practice-based research network; health behavior

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Acknowledgments: We thank the participating practices: Denver Health Medical Plan, Denver Health’s Montbello Family Health Center, Fort Morgan Medical Group, Metro Community Providers Network Parker Place Clinic, Plains Medical Center in Limon, Rose Family Medicine Residency, St Mary Family Medicine, Salud Family Health Center Fort Morgan, Southern Colorado Family Practice, Swedish Family Medicine Center, University of Colorado Family Medicine Westminster, and Wray Family Clinic.

References


Mutual Learning and the Transformation of Study Intervention Tools

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Conflicts of interest: none reported

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PURPOSE

We planned a multicomponent intervention to increase primary care practices’ provision of health behavior advice and patients’ access to resources for health behavior change. The intervention included 2 tools: (1) a Web-based resource (http://www.arch2healthyhabits.org) consisting of a database of community programs for health behavior change (eg, smoking cessation classes) and links to health behavior self-management resources (eg, change strategies), and (2) a prescription pad for health behavior change (Pad).1 The pocket-sized Pad, measuring 4 in by 6 in, was designed to facilitate clinician-patient discussion of health behaviors and to prompt treatment planning. The uniform resource locator (URL) and a
checklist of major sections of the Web-based resource were preprinted on the Pad to assist clinicians in directing patients to the resource for additional change support. This article describes the exchanges between the study team and the participating practices that resulted in successive innovative iterations of the Pad.

**METHODS**

Seven practices from the Research Association of Practices (RAP), a practice-based research network, participated in the study. Practices were recruited and interventions were implemented on a rolling basis. The study had a pretest-posttest design and involved both quantitative and qualitative data collection. A practice facilitator collected 1 to 2 days of baseline ethnographic data including observations of the practice’s physical systems (eg, computer availability), current approaches to providing health behavior advice, and staff attitudes toward health promotion. Similar data were collected after the intervention. In combination with baseline patient survey data about current health behaviors and receipt of health behavior advice, the qualitative data were summarized into a practice report.

The practice facilitator led a practice-wide planning meeting to discuss the baseline data and how the intervention tools might be tailored and implemented. At the close of the meeting, the facilitator encouraged formation of a smaller team consisting of a variety of practice members. This team and the facilitator met several times to brainstorm ideas, discuss options, and generate final tailoring decisions. Team decisions were typically arrived at by consensus, although clinicians’ opinions tended to carry greater weight in most of the practices.

After implementation of the intervention, ongoing interchanges between the practice and the facilitator continued in the form of telephone calls with key team members to learn how implementation plans were proceeding, drop-in visits to check supplies and maintenance of intervention procedures, and for some practices, additional team meetings to solve implementation problems. Field notes documenting each contact with a practice member were recorded.

**LESSONS LEARNED**

The participatory approach to tailoring the intervention and the ongoing implementation support provided by the facilitator led to a synergistic exchange of creative ideas among practices, resulting in substantial changes to the Pad. With the practice facilitator acting as a conveyer of key information about each practice’s tailoring decisions, accumulated wisdom was shared at practice team meetings to adapt the tools in successively more innovative ways. The facilitator’s stories of past developments from previously launched practices spurred brainstorming and discussion at each successive practice, resulting in additional modifications in accordance with the needs of that practice. Table 1 depicts the sequence of events that led to one major change in the Pad.

Through ongoing, iterative conveyance of practices’ innovative ideas via the facilitator, the Pad’s design and method of use were further modified. For example, practice 6 engaged medical assistants to check off health behavior topics the patient wished to discuss. The Pad was then clipped to the chart for the clinician. Used in this manner, the Pad was transformed into a screening tool and clinician reminder. Other innovations included

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**Table 1. An Example of the Sequential Transformation of the Pad**

<table>
<thead>
<tr>
<th>Practice No.*</th>
<th>Need or Idea</th>
<th>Innovations and Modifications in Tools or Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Requests a list of titles of all support materials for health behavior change that are available on the Web site to more easily direct patients to specific topics.</td>
<td>Facilitator generates a hard-copy list of available titles organized by topic.</td>
</tr>
<tr>
<td>4</td>
<td>Requests paper handouts of patient support materials printed from the Web site for patients with low computer literacy. Requests handouts be organized in a number-based filing system used in conjunction with the list of titles from practice 2.</td>
<td>Facilitator prints selected handouts from Web site and numbers them for easy organization and access.</td>
</tr>
<tr>
<td>5</td>
<td>Requests a paper handout system similar to that of practice 4, but suggests a patient self-serve file would better suit their needs. Suggests that clinicians should write the handout number on the Pad to allow patients to access handouts in the file themselves.</td>
<td>A numbered file of handouts is placed in a publicly accessible area so that patients can retrieve handouts themselves as they exit by referring to the number their clinician wrote on the Pad.</td>
</tr>
<tr>
<td>6</td>
<td>Requests a patient self-serve handout system similar to that of practice 5. Clinical staff notes inefficiency of writing a number on the Pad and suggests placing handout numbers on the Pad itself so clinicians can simply circle the appropriate number.</td>
<td>Facilitator expands the size of the Pad from a half sheet to a full sheet to accommodate a list of numbers.</td>
</tr>
<tr>
<td>7</td>
<td>Requests a self-serve handout system, but notes inefficiency of looking for handout title on a separate piece of paper, then circling a number; suggests incorporating the title listing/numbering key itself on the Pad.</td>
<td>The title listing/numbering key is fully incorporated into the full-page Pad.</td>
</tr>
</tbody>
</table>

*Practices were numbered in the order of enrollment.
printing the Pad in a distinctive color to enhance its use as a clinician reminder and adding visual icons for use with low-literacy patients in place of written advice.\textsuperscript{2} What started as a prescription pad for health behavior change was transformed through the cumulative wisdom of 7 practices into a new, multipurpose tool.

**CONCLUSIONS**

Although we intended to tailor the tools to practices’ needs, the methods used in this study facilitated changes in the tools’ intended use and design beyond our expectations. For such innovations to occur, the research team must assume roles as both learners and conduits of cumulative participant wisdom, rather than as experts.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S54.

**Key words:** Health promotion; practice-based research network; health promotion/disease prevention; Internet; health behavior; patient education

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**Acknowledgments:** We wish to acknowledge the clinicians, staffs, and patients from the 7 family practices that participated in this project: Neighborhood Family Practice; the practice of Drs Weinberger and Vizy, and Ms DuBay, PA; the practice of Dr Kellner; the practice of Dr Kinch; Southwest Family Physicians; the Metrohealth Thomas F. McCafferty Health Center; and University Primary Care (Bedford location).

**References**


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**Minnesota Clinicians Motivating Health Improvement (MINIT) Study: Motivating Healthy Habits**

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**Conflicts of interest:** Dr. Botelho is owner of www.MotivateHealthyHabits.com, the MHH online learning program, and MHH publication, LLC.

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**PURPOSE**

The MINIT (Minnesota Clinicians Motivating Health Improvement) Study was designed to target 4 risk behaviors that are strongly linked to a variety of negative health outcomes in the United States: (1) cigarette smoking, (2) sedentary lifestyle, (3) poor diet, and (4) risky drinking.

The specific purpose of this investigation was to field-test an interactive educational program that implemented a motivational approach to behavior change in order to enhance the use and success of established behavior-specific modification programs.

**METHODS**

We recruited for the study 114 patients from 10 participating community-based primary care clinics within the Minnesota Academy of Family Physicians Research Network (MAFPRN). Subjects were initially identified by the physician or site coordinator as having 1 of the 4 targeted risk behaviors, and were not actively participating in behavior change or a behavioral intervention program. After introducing the study to patients and obtaining appropriate consent, we asked participants a set of questions to assess their readiness to change. They were also assessed on a scale of 10 motivational
process measures, and finally they selected 1 of the 4 risk behaviors to serve as their focus for the remainder of the study. Patients were asked to choose 1 of the following motivational intervention options to assist in self-assessment of their motivation and behavior: (1) a self-help guidebook,1 (2) the guidebook plus telephone counseling, or (3) an Internet-based course with telephone counseling. The motivational intervention was not intended to substitute for a weight loss program, smoking cessation program, exercise program, or alcohol cessation program. If participants sought to address a specific unhealthy behavior as a result of the motivational intervention, their physician or study coordinator assisted them with existing community resources.

We recruited 4 local and national organizations as existing resources for behavior-specific support. The Minnesota Partnership for Action Against Tobacco provided self-help materials as well as telephone counseling support in smoking cessation. Hazelden Foundation was identified as a resource for addressing risky drinking. The Small Steps, Big Rewards program from the National Institute of Diabetes and Digestive and Kidney Diseases was a resource for addressing poor diet, and Be Active Minnesota provided self-help and Internet resources to address sedentary lifestyle. Study clinics and the central study center were then able to refer participants who became more motivated during the study to appropriate resources located within their own community.

Participants generally completed the self-help guidebook1 in 1 to 3 hours. The guidebook plus telephone counseling intervention entailed working through the guidebook, and 2 telephone calls, each lasting 20 minutes (with 2 to 3 brief additional calls if desired). The Internet-based course entailed 2 sessions, each lasting approximately 40 minutes. Research staff contacted participants by telephone at baseline and again 30 days and 180 days thereafter for follow-up. During these calls, staff specifically focused on 10 motivational process measures, subjects’ readiness to change, and the use of existing change programs.

LESSONS LEARNED
The research consent process itself was an important element in successfully initiating patients’ readiness to change and promoting risk-specific behavior change. This brief patient-physician encounter appeared to influence the recruitment to and the effectiveness of all subsequent interventions. The impact of patients’ personal physician asking if they are interested in thinking about behavior change, not actually beginning any risk-specific intervention, appeared to start the process of changing their stage of readiness.

The consent process augmented the impact of the subsequent motivational intervention and was not captured by our baseline tool. Because baseline measures were assessed after the consent process, subsequent change in readiness reflects the initial patient-physician study enrollment discussion, the time spent completing the process of informed consent, and finally, the impact of the motivational intervention as designed in the study.

Regular and direct contact with a person (ie, telephone calls instead of e-mail) appears to be a key element in successful behavioral change. Human interaction was the preferred method of promoting behavioral change. Although participants were very responsive to our 30-day and 180-day follow-up telephone contacts, they did not initiate any telephone calls into our central site for additional counseling support, yet they remained engaged in our study design.

Participants who had selected self-help as their intervention regularly discussed motivation and behavior change during their follow-up telephone calls, which were intended to be scripted. “Self-help’ therefore usually spontaneously converted to telephone support after patients received the 30-day follow-up telephone call.

For 3 of the risk behaviors studied—smoking, sedentary lifestyle, and poor diet—the variety of intervention options was successful in providing most participants with essential commitment to the study and progress toward improving the behavior. Patients in the risky drinking group, however, chose to leave the study before the baseline survey was conducted.

CONCLUSIONS
Initial conversations with patients can strongly influence their health behavior change process and are not as difficult as commonly perceived. The consent process is an important interaction in initiating behavioral change and has the potential to confound evaluation of behavioral interventions. In particular, physician-obtained consents have a positive effect on readiness to change and likely enhance the effect of subsequent motivational interventions.

It is important to provide real human contact and follow-up to subjects to instill a sense of accountability in behavior change. Our findings suggest that offering patients a variety of intervention options can promote both initial readiness to change and progress toward smoking cessation, increased physical activity, and healthier diet.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/556.

Key words: Primary care; practice-based research network; health behavior; behavioral/psychosocial; health promotion/disease prevention; smoking; alcohol drinking; physical activity
Reducing Tobacco Use and Risky Drinking in Underserved Populations: The Need for Better Implementation Models

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CONFLICTS OF INTEREST

none reported

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PURPOSE

The prevalence of many health behavior risk factors (eg, smoking, risky drinking, physical inactivity) are highest among uninsured and Medicaid-eligible populations.1 Screening and brief behavioral counseling in high-volume Federally Qualified Health Centers (FQHCs) are key elements of a cost-effective public health approach to the early identification and management of high-risk patients. This project examined 3 different ways to implement a combined screening and brief intervention (SBI) program for smokers and at-risk drinkers in FQHCs.

METHODS

Practices in 6 New England FQHCs were randomized to 1 of 2 SBI implementation models: the clinician model, in which a physician or physician’s assistant conducted the brief counseling services, or the specialist model, in which a staff medical assistant or nurse conducted the brief counseling services. In all, 24 clinicians and 13 specialists participated. A seventh practice was selected to test a health educator model, in which an external assistant who was not a staff member conducted the SBI services. Key staff from the general medicine departments at each site participated in a 3-hour continuing medical education–accredited training session before beginning a 4-month implementation phase. The implementation phase was followed by a 4-month sustainability phase during which the sites had less frequent contact with the research team, but continued to conduct SBI and were monitored for progress. SBI was conducted using standardized procedures for risk factor screening combined with brief counseling for smoking cessation or reducing risky drinking.2,3

The relative penetration of each model was assessed, along with changes in clinicians’ attitudes, knowledge,
and practice behavior. We used 2 primary outcome variables to measure the uptake of SBI procedures in participating practices: the proportion of patients screened and the proportion of patients at risk who received a brief intervention. We computed the first measure by dividing the total number of screenings by the number of patient clinic visits for participating staff during the study period. To compute the second measure, we divided the number of patients who received an intervention by the number of patients screening positive for each of the risk behaviors. Secondary outcome measures (eg, changes in clinicians’ attitudes and knowledge) were assessed using a medical staff survey administered to participating medical staff before the training and again at the end of the implementation phase. We also conducted poststudy debriefing interviews with medical staff. Institutional review board approval was granted before the beginning of the study.

LESIONS LEARNED

Across the 7 sites, 3,502 patients were screened during the 8-month study period. Because of the large number of participating clinicians, the majority of patients were screened at sites using the clinician model (64%), while fewer were screened at sites using the specialist model (28%) and the health educator model (8%); however, the health educator model produced a substantially higher overall screening rate (82%) than the clinician model (18%) or the specialist model (25%). In addition, screening rates were higher in the smaller practices (ie, those with lower patient volume), although patient load per clinician was similar across sites, with a mean of 75 patients per week per clinician. During the implementation phase, rates in the 2 smaller clinics (1 clinician model and 1 specialist model) were higher than 90%, whereas less than 6% of eligible patients were screened at the 2 higher-volume clinics (1 clinician model and 1 specialist model).

Of patients screened, approximately 40%, 44%, and 38% of those at practices using the clinician, specialist, and health educator models, respectively, were current smokers. On average, the corresponding proportions of patients reporting risky drinking were 10%, 15%, and 9%. The brief intervention rates for patients who screened positive for tobacco use and risky drinking were similar across models, with two thirds of at-risk patients receiving counseling in each of the 3 models. The program was not sustained in either the clinician model or the specialist model beyond the implementation phase and was terminated early (ie, during the implementation phase) in 2 clinics due to staff burnout.

As measured by attitudinal questionnaires and poststudy debriefing interviews with 38 staff members, the majority of participating clinic staff agreed philosophically with the need to conduct SBI but found it difficult to provide the service in the course of a busy clinic day. Lack of time was identified as the primary barrier to successfully implementing the program. Overall, clinic staff indicated that they had gained new skills from the experience and were more confident in providing brief interventions to patients. They nevertheless reported that the program was too burdensome to conduct on a regular basis. To reduce the burden, staff suggested “limiting SBI to preventive visits” or to specific times of the year (eg, “tobacco screening month”). Staff also indicated that they intended to screen patients for risk behaviors “more often now.” Despite these good intentions, the data did not substantiate such claims. When asked during the debriefing interview which model would be most effective, staff unanimously chose the health educator model.

CONCLUSIONS

Based on the lessons learned from our project, we suggest the following take-home messages:

- High prevalence of behavioral risk factors at FQHCs make these sites ideal for SBI programs.
- Screening is the key component of such programs. Once screening is conducted, it is highly likely that brief interventions will be delivered to those at risk.
- Because current staffing at FQHCs is inadequate to implement and sustain SBI activities, an alternative model that carves out key SBI elements to dedicated health educators may have considerable promise within a broader public health approach to behavioral risk factor reduction.

Although the results of our study should be interpreted within the limits of its quasi-experimental design, our findings are consistent with previous research indicating that behavioral risk factor screening programs for alcohol abuse and tobacco use are difficult to implement unless critical logistical barriers are overcome. Even though our data indicate that brief interventions will be delivered to a large proportion of patients who screen positive for risky drinking or smoking, current clinic staffing does not support the necessary office systems to implement and sustain the screening service. Within higher-volume clinics particularly, frontline staff have increasing demands to expand their standard intake procedures, leaving little time for additional activities such as risk behavior screening. The development of effective implementation models for routine or opportunistic screening is therefore essential, especially for high-volume clinics that treat a great number of the at-risk population. Our study shows that a model in which the SBI elements...
Collaborative Goal Setting to Improve Lifestyle Behaviors: Lessons Learned From NOPCRN

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Purpose

We examined the effectiveness of a multicomponent lifestyle activity intervention for overweight or obese patients with impaired fasting glucose (prediabetes). The physician-directed counseling intervention included collaborative goal setting with patients to achieve specific changes in physical activity and nutrition behaviors. Nurse surveillance was used to provide reinforcement and to monitor progress.

Methods

We randomized 88 adult patients with prediabetes and a body mass index of 25 kg/m² or greater to either an immediate- or a delayed-intervention group. Individual-
ized goals for weight reduction, physical activity, and nutrition intake were negotiated between the physician and the participant. Participants used pedometers to monitor their physical activity and were scheduled for brief follow-up visits in the practice (ie, nurse surveillance). We included 4 primary care practices in the Northwest Ohio Primary Care Research Network (NOPCRN) and 2 physicians from each practice.

We used a combination of methods to identify eligible participants. In a previous diabetes screening study, we identified a large number of patients with prediabetes. These patients' physicians sent them a letter with an invitation to participate in this study. In a less effective, alternative approach, physicians and office staff identified eligible patients during routine visits or from laboratory records.

The physician-directed counseling intervention was based on the program of the National Institutes of Health and the North American Association for the Study of Obesity.1 With the assistance of a handheld computer, physicians use the interactive guideline tool developed by the National Heart, Lung, and Blood Institute Obesity Education Initiative (http://hin.nhlbi.nih.gov/obgd/palm.htm) to establish individualized therapy targets for weight reduction, physical activity, and nutrition. It was up to the physician and patient to negotiate reasonable goals to reach those targets.

We scheduled a 3-hour group training session for the physician participants. Physicians were introduced to the aforementioned program and given copies of the material for review. They were also given a Palm 125 handheld computer (palmOne Inc, Milpitas, Calif) and instructed on the use of the Obesity Education Initiative tool. The interactive tool prompts the physician to enter the patient's weight, height, sex, waist circumference, and individual risk factors. It instantly calculates body mass index and presents a standardized set of weight loss targets and treatment options based on individual patient parameters.

In the next step, one of the investigators (KP) demonstrated collaborative goal-setting strategies with a standardized patient volunteer. Emphasis was placed on setting simple and measurable goals with the patient. For example, if a patient's baseline activity level was 2,500 steps per day, then working on a 10% increase in steps per day each week over the 12-week period might be an achievable goal. If the patient skipped breakfast most days per week, snacked frequently at work, and consumed most of his or her daily calories during the evening meal, then 3 reasonable and achievable goals might be not skipping breakfast, avoiding snacks in the workplace, and decreasing portion sizes at the evening meal.

Once randomized, participants were scheduled to meet with the physician for a 30-minute counseling visit. Individualized goals for weight reduction, physical activity, and nutrition intake were negotiated between the physician and the participant. Participants used a pedometer to self-monitor daily physical activity. The pedometer provided real-time feedback that informed participants about daily progress in achieving physical activity goals.

For 12 weeks, the Research Nurse Coordinator (RNC) monitored participants' progress toward achieving goals. This surveillance included brief scheduled office visits with the RNC every 2 weeks to measure weight and blood pressure, and to assess compliance with using the pedometer. The RNC also gave feedback to the patient via telephone. If a participant was having difficulty achieving activity or nutrition goals, the RNC worked with the participant in identifying barriers and potential strategies for overcoming them. The RNC generated brief progress reports that were sent to the physician via e-mail.

**LESSONS LEARNED**

We quickly learned that 1 group training session was inadequate preparation for the physicians. We scheduled follow-up one-on-one sessions with each physician to review the protocol and to practice establishing physical activity and nutrition goals. Physicians reported having difficulty changing from their usual practice in counseling patients to the counseling intervention designed for the study. Incorporating collaborative goal setting with participants into their counseling practice was particularly challenging. Specifically, setting simple, measurable goals for changing activity and nutrition behaviors with participants required practice.

Initially, physical activity goals were often too ambitious for most participants to achieve, and some of the nutrition goals were too vague. For example, the recommended activity goal of 10,000 steps per day most days of the week was far beyond the ability of most study participants. Recommending a limit on the number of calories consumed per day was also too global and failed to focus on specific eating behaviors. We recommended that physicians explore barriers that interfere with participants being more active or adopting healthier eating habits, and begin to negotiate goals around those barriers. Next, we recommended that the initial physical activity goals established with participants be limited to a 10% increase in steps per week over the 12-week period. Finally, we recommended that no more than 3 nutrition goals be established at the initial visit. Each of these goals could be reset upward or downward depending on the patient's progress, which was being monitored by the RNC.

Although surveillance of physicians was not explicitly planned in the study protocol, the RNC did observe and monitor physicians as they attempted to
carry out the counseling intervention. In fact, some of the physicians asked her for assistance initially, and with practice they seemed more comfortable with the intervention.

Approximately 1 month after data collection began, we scheduled another group session with participating physicians to review progress and to identify any additional problems they might be experiencing.

We do not have any specific evidence to support the sustainability of the intervention other than the RNC’s observations and discussions with participating physicians and their anecdotal reports. Several physicians have independently reported that they have since incorporated collaborative goal setting into their usual practice when counseling patients on weight loss.

The collaborative goal-setting intervention combined with nurse follow-up is a potentially powerful strategy for improving health behaviors; however, our study was not designed to specifically address this question. We were interested in knowing if this combination was feasible in practice to improve lifestyle behaviors and specific health outcomes.

CONCLUSIONS

To facilitate the integration of the intervention into practice, we used specific strategies: (1) electronic tools that guided physicians in setting targets for weight loss, physical activity, and nutrition intake, (2) physician training in brief behavior counseling using collaborative goal setting, and (3) nurse surveillance to provide reinforcement and monitor patients’ progress.

Limited time, skills, and resources combined with inadequate reimbursement impede physicians’ ability to provide healthy lifestyle counseling.1, 2 Goal setting has been shown to be an effective strategy for modifying dietary behavior4 and improving adherence to exercise,5 particularly when the patient and health care professional establish the goals together.

Before this study, collaborative goal setting with patients to improve physical activity and nutrition behaviors had not been a routine part of the primary care physicians’ counseling practice. We underestimated the training and practice time required for physicians to use collaborative goal setting effectively with the participants. Once this intervention was learned, physicians were quick to adopt it into their usual practice.

Successful implementation of a collaborative goal-setting intervention for promoting lifestyle behavior change in practice requires an initial investment in time and training in these methods. Setting simple, measurable goals for changing physical activity and nutrition behaviors with participants requires practice. Finally, engaging nurses or other office staff in the practice may be “key to leveraging the effect”6 of the physician counseling intervention.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S60.

Key words: Primary care; practice-based research; health behavior; prediabetes; obesity; diabetes mellitus; prediabetic state; computers, handheld; physical activity; weight loss; diet

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References


The Healthy Teen Project: Tools to Enhance Adolescent Health Counseling

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PURPOSE

The leading causes of preventable disease, disability, health care burden, and premature death in the United States are related to 4 health risk behaviors: sedentary lifestyle, unhealthy diet, tobacco use, and risky drinking. These behaviors are often interrelated, occur in a complex context and have their roots in childhood and adolescence.

Given the competing demands of primary care, only a very limited portion of the doctor-patient interaction is devoted to addressing these health risk behaviors. The visit is instead structured around gathering a health history and performing the physical examination. To assist adolescents in making healthy decisions, the emphasis of clinical encounters needs to be shifted from data-gathering to helping patients adopt and maintain healthy behaviors.

The purpose of our study was to create tools to improve health risk screening, counseling, and support for targeted behavior change among adolescents in primary care practices. We set out to create a package of tools that would facilitate integration of effective adolescent health behavior counseling into primary care practices. We aimed to create tools that would be easy to implement, inexpensive, and effective, and would be sustainable for use in practice.

METHODS

The Healthy Teens Project formed a working group of academic faculty and 6 physician innovators from 3 pediatric and 3 family practices in the Clinicians Enhancing Child Health (CECH) practice-based research network at Dartmouth Medical School. The CECH network of 24 primary care practices in New Hampshire and Vermont is committed to improving clinical services for children and adolescents. For this project, we developed an adolescent health risk assessment tool (screener) administered on a personal digital assistant (PDA). The 90-item screener took 7 to 8 minutes for teenagers to complete and assessed nutrition, exercise, tobacco use, and alcohol use, as well as other health concerns and psychosocial risks included in the Guidelines for Adolescent Preventive Services.2 The physician reviewed a summary of the results on the PDA before the visit. Identification of teens’ strengths and risks and concerns helped clinicians focus their discussion during the short time scheduled for the visit. We also created a health action plan form to record specific steps adolescents were willing to take to improve their health. Adolescents took this “health prescription” home. Those who committed to action steps were offered follow-up via e-mail to provide problem-solving and to support their actions.

The physician innovators, with the support of the research team, used their own practices as laboratories to test the PDA screener and action plan forms. A beta version of each tool was developed by the research team. The group conferred monthly, revising tools in response to experiences in the practices. The research team provided technological support for data collection and assisted with incorporating the tools into current office systems. A 2-hour program on motivational interviewing and goal setting provided training to the innovators on patient-centered counseling and developing action plans. An e-mail follow-up protocol was developed whereby medical students would contact...
the teens and provide support for their planned actions over 4 weeks.

This report covers the key lessons learned about these new clinical tools from informal interactions and a survey of clinicians (n = 15) in the 6 practices who used the PDA screener and the action plan materials. We analyzed exit questionnaires given to adolescents before (n = 67) and after (n = 98) implementation of the new tools to assess their perceptions of the quality of the visit and the topics discussed. Adolescents’ views of the PDA screening and desired follow-up are based on these exit questionnaires.

LESSONS LEARNED

Our experience suggests that collaboration between academic researchers and primary care clinicians is the key to developing practical tools and office systems. The project was rooted in a collaborative process wherein family medicine and pediatric practice innovators worked closely with academic researchers. This team process facilitated rapid cycles of development and testing of the PDA screener and its implementation in the primary care practice laboratories. Physician innovators shared real-life experiences and practical strategies to counsel teens and to integrate the PDA into the office flow. The action plan worksheet was tested in clinical care and revised in 4 cycles by the team. Without this team process, we would not have been able to respond to the real-world clinical issues. These innovators also served the role of informing and engaging other clinicians in their practice. Developing practical practice systems is enhanced by the ongoing work of a joint academic–primary care team.

PDA screening was well received by teens and clinicians. The PDA screeners offered a novelty that engaged adolescents. Teens preferred the PDA to paper screeners or “being grilled by the clinician.” The small screen size and the feature that answers disappeared from view meant teens could privately complete the PDA screener while sitting next to a parent in the examination or waiting room. Teens were candid and willing to share personal information via the PDA, and the PDA opened up conversation with adolescents about important issues not otherwise revealed.

In a postvisit survey of 98 adolescents, 73% said the screener made it easier to discuss issues with their health care professional. Clinicians' feedback overall was very favorable, and all the clinicians have continued to use the PDA screeners in their routine care.

Technology allowed centralized data collection in this study. Information delimited by the Health Insurance Portability and Accountability Act (HIPAA) was collected from the PDAs. Data were sent from each practice via the Internet to a CECH central computer daily. We ultimately succeeded in establishing this data synchronization of PDAs in 5 of our 6 practices. This system can be used for ongoing data collection for other projects. For the sixth practice, we exchanged PDAs via mail. We had the challenge of negotiating with information technology consultants at multiple small practices. Despite the emerging electronic medical record and use of the Internet, we found community practices lacked on-site expertise and often had older equipment not compatible with our software. Once established, however, synchronization of the PDA was simple enough to allow primary care office and nursing staff to routinely transmit data to the central office.

Our experience suggests that committing to a postvisit action plan is challenging for teens. Most adolescents were not prepared to think of “problems” and changing health risk behaviors during routine check-ups, in contrast to visits for an identified chronic condition or specific complaint. Clinicians discussed health risks from the screener as well as the concerns raised by the teens. Our clinicians found it difficult, however, to develop specific planned action steps with teens, especially younger teens. When a teen identified a specific concern, clinicians were more able to problem-solve and develop a plan. The action plans were the entry into e-mail counseling support, and thus this tool was offered to few teens. Whereas only 6% to 7% of teens were interested in e-mail for follow-up information, 28% were interested in receiving additional information after the visit. The lack of interest in e-mail contact from the office, even before being offered as follow-up to action plans, makes this option of postvisit support less likely to work for many teens. Selective use of action plans for teens once they are interested in making a change may be better received. The discussion of specific strengths and health risks was well received by adolescents and may be built on by providing all adolescents with specific written information about their strengths and health risks with targeted take-home materials.

CONCLUSIONS

The PDA-based screener has been well received by both adolescents and clinicians and is a first step to increasing health counseling during adolescent well care. Adolescents' completion of the screener on a PDA is an efficient, confidential method to collect comprehensive health information at well visits. This approach informs clinicians before meeting with teens and allows clinicians to use their limited time counseling rather than data-gathering. Engaging adolescents in specific
health action steps is challenging. Clinicians need more training in motivational counseling to influence adolescents. Adolescent-appropriate informational materials and referrals also need to be available. With further development, this innovative health screener could be an attractive tool for clinicians wanting to improve the adolescent health care they provide.

To read or post commentaries in response to this article, see it online at http://www.annfammed.org/cgi/content/full/3/Suppl_2/S63.

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References

Modular Lifestyle Intervention Tool: A Handheld Tool to Assist Clinicians in Providing Patient-Tailored Counseling

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PURPOSE

Although proven health promotion interventions exist for effecting health behavior change, most physicians rarely go beyond simple advice or education when discussing health risk behaviors.1 The primary goal of our project was to develop and assess the effectiveness of a handheld computer clinical decision support tool, the Modular Lifestyle Intervention Tool (MLIT). The MLIT was designed to improve clinicians’ ability to provide patient-tailored counseling at the point of care regarding tobacco use and unhealthy diet as it contributes to obesity and overweight.

METHODS

We created the MLIT by convening a multidisciplinary software development group (SDG) that included a family medicine researcher with experience in obesity, 2 general internists with expertise in smoking cessation and motivational interviewing (MI), and a clinical psychologist with expertise in MI. The group successfully adapted 2 clinical guidelines (the Public Health Service's Clinical Practice Guideline for Treating Tobacco Use and Dependence1 and the National Heart, Lung, and Blood Institute's Obesity Education Initiative2) and the behavioral health theories of the 5 A’s,3 the stages of change,4 and MI5 into a logical and navigable format. The SDG used an iterative process, meeting weekly for approximately 12, 1-hour sessions. The physical layout of the MLIT was represented using Microsoft PowerPoint (Microsoft Corp, Redmond, Wash), which visually simulated the spatial limitations of a handheld computer screen. Hypertext links within this program were used to simulate the navigation between screens on a handheld computer. Professional
programmers designed the software for both Windows CE and Palm platforms.

The SDG developed a theoretical framework that integrated the 5 As, stages of change, and MI (Figure 1). Using the traditional 5 As, the ask component was operationalized by encouraging practices to adopt smoking status and body mass index as vital signs. This approach was designed to prompt physicians to ask about smoking and weight loss, but was not included in the MLIT software. The advise component was integrated into the tool by including information on MI that would facilitate nonconfrontational advice from physicians. The assess and assist components were operationalized using the stages of change theory. The MLIT uses 2 questions on 1 screen to guide the identification (assessment) of the patient’s current stage of change, then directs the clinician to assist by providing a staged-based multidimensional course of action to effect behavior change. For example, for a clinical encounter with a patient who smokes and is considering quitting in the next 6 months, but not within the next 30 days, the MLIT assessment screen automatically informs the clinician that the patient is in the contemplation stage of change and lists stage-appropriate interventions. Each stage is linked to an MI script and stage-relevant clinical content. The scripted MI uses the DARES approach: developing discrepancy, avoiding argumentation, rolling with resistance, expressing empathy, and supporting self-efficacy. For this patient, the MLIT recommends that the patient reflect on his or her quit attempt. The MLIT prompts the clinician to arrange follow-up and provides a list of both local and national resources.

We used a pretest-posttest design to evaluate the effects of the MLIT in a group of academic physicians. The primary outcomes were physician knowledge, behavior, and perceived self-efficacy and comfort in applying effective behavioral counseling techniques before and after use of the tool. We also conducted focus groups at the study’s conclusion to better understand how the tool was used, barriers to its use, and how the tool could be improved.

LESSONS LEARNED

Many clinicians, even computer-savvy ones, needed the research team to install the MLIT software. Numerous technological barriers were unanticipated, including our institution’s network firewall, the variety of older handheld computers still in use, and the inability of many clinicians to synchronize their handheld computer to their desktop computer (because of institutional security precautions). These barriers required that our study coordinator spend more time with each clinician than originally planned. We used unanticipated contact to provide project education and support. Busy clinicians, particularly novice handheld computer users, needed encouragement to use the MLIT in the setting of a patient-doctor clinical interaction. First impressions were critical. It was very difficult to overcome resistance to using the program after a clinician had initial problems with the technology.

Using an SDG composed of local content experts to develop the MLIT was successful and efficient. Members of the group understood the competing demands of primary care, were supportive of the project’s underlying premise, and were able to distill complex guidelines and behavioral theories into a simple, easy-to-use tool for use at the point of care. One author (SMS) had experience with developing software and adapting clinical guidelines for use on handheld computers. Having content experts meet with a physician who is competent in software development is essential for the group to understand the capabilities and limitations of the software (eg, the need to minimize complexity to reduce program size) and hardware (eg, the need to minimize text because of small screen size). This physician also met frequently with the programmers to ensure the feasibility of the tool as envisioned by the SDG. Early iterations of the MLIT were demonstrated and evaluated by both the SDG and the research team using Microsoft PowerPoint in group settings. This approach allowed real-time mock use of the tool through role-playing scenarios and is the subject of a future paper. Through this process, we believed that a similar approach might be successful in adapting clinical guidelines for any type of computer system (eg, electronic medical records, Web-based systems) to support clinicians at the point of care.
Originally conceived as a clinical decision support tool, the MLIT is better framed as “continuing medical education (CME) on the fly.” Adult learning principles suggest that adults learn best on a need-to-know basis in real-time, hands-on experiential settings. The MLIT allows the user to acquire knowledge of complex behavioral change theory at the point of care through the provision of targeted and scripted language specific to the patient’s stage of change. As physicians internalize the MLIT approach to behavior change counseling, they will have less need to use the tool. The MLIT content can be changed to match physicians’ CME needs.

CONCLUSIONS

It is possible to design innovative, dynamic, and accessible tools that can improve the delivery of effective patient-tailored counseling using handheld computers. These tools are probably best developed and evaluated by primary care physicians and researchers with the support of software programmers. This combination better ensures the development of clinical decision support tools that are useful and practical. Our study illustrates a successful collaborative development process that can be replicated in other settings. Designing and implementing innovative information technology solutions to clinical problems is fraught with technological hurdles. Even computer-savvy clinicians require face-to-face instruction, structured orientation, and direct encouragement, combined with ongoing feedback, to overcome initial resistance to incorporating new tools and paradigms into clinical care. Physicians can use these tools to assist behavioral change efforts, and may also acquire new knowledge in the process, indicating a potential use for delivering CME at the point of care. We have developed and are validating a pretest and posttest to measure this acquisition of new knowledge and increases in physicians’ perceived self-efficacy in effecting behavior change.

References

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