

2. What Have HMOs Learned about Clinical Prevention Services? An Examination of the Experience at Group Health Cooperative of Puget Sound*

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THE DEVELOPMENT AND IMPLEMENTATION OF effective preventive services in clinical practice is an important issue on the national health agendas of the United States (U.S. Department of Health and Human Services 1991) and Canada (Canadian Task Force on the Periodic Health Examination 1980). The U.S. Preventive Services Task Force (1996a), the Canadian Task Force on the Periodic Health Examination (1988), and several specialty societies have produced recommendations for clinical preventive services for children and adults (Eddy 1991; Sox 1994). The National Cancer Institute (Greenwald and Sondik 1986) and the National Heart, Lung and Blood Institute (National Cholesterol Education Program Expert Panel 1988) have developed treatment recommendations to encourage integration of prevention services into practice. The U.S. Public Health Service's Office of Health Promotion and Disease Prevention developed "Put Prevention into Practice," a program for implementing clinical prevention services, and the National Cancer Institute's Division of Cancer Control program created training materials for practitioners to use in office-based smok-

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ing cessation efforts (Glynn and Manley 1991). The potential value of prevention has recently been articulated by McGinnis and Foege (1993).

Furthermore, surveys of physicians indicate their acceptance of the value of implementing clinical prevention services (Weschler et al. 1983; Orleans et al. 1985; Scott, Neighbor, and Brock 1992); however, implementation rates are low. For example, when Lewis examined 32 studies of accounts by primary care physicians of what they accomplished in clinical practice, he found—for immunizations, cancer screenings, life and risk factor counseling—that they consistently overestimated the services they actually performed by a factor of two- to sixfold when compared with audits or patient reports and that performance rates were generally low (Lewis 1988). Pommerenke and Dietrich, in their review of efforts to improve and maintain preventive services, stated: “The status quo is difficult to change and medical practice is no exception. The importance of this problem cannot be over-emphasized” (Pommerenke and Dietrich 1992a,b). Based on their work from the Minnesota Heart Studies, Kottke, Brekke, and Solberg (1993) have delineated a series of *barriers* to the implementation of primary and secondary prevention services:

1. The health care system and its culture limit the flexibility of the lone, energized physician. The “intention to help” by itself is inadequate justification for change because systems thinking is not a customary process for physicians, who also must convince colleagues and staff of the necessity for change and often must rely on office processes and information systems that are inadequate for the new task.
2. Prevention issues do not compel action in clinical settings. The aim of preventive care is to promote the health of asymptomatic individuals; however, the current health care system defines the physician’s job as responding to complaints (symptoms).
3. The health care system at present emphasizes urgency rather than severity. The physician focuses, then, on acute problems expressed by patients, not on hidden or asymptomatic issues, which are often more important in the long run.
4. Time constraints and patient demand cause the physician to respond rather than to initiate. Day-to-day practice for the physician is like being on a rapidly moving treadmill—the pressure is

- high to respond to the expressed complaint and "move on" in order to keep up.
5. Preventive care does not correspond to the physician's self-image. Clinical preventive medicine resembles a "cookbook" method that can be done by others.
 6. Feedback from preventive care is negative or neutral. The physician does not "hear" from the woman who had late-stage breast cancer averted by mammographic detection and thus receives no feedback. Instead, the physician sees false positive reports from screening or hears patients complain about low-fat diets or about repeated advice to quit smoking.
 7. Adequate resources are not available for clinical prevention services. However, it is clear that simply removing the dollar barrier will not ensure that preventive care services will be prescribed (Lurie et al. 1987).
 8. The potential for counseling as an intervention is underappreciated, and physicians lack skills in the application of patient behavioral change strategies. The major causes of morbidity and mortality in the United States are clearly behaviorally linked (McGinnis and Foege 1993). At the level of clinical practice, the intervention for these major risk factors is counseling (Sox 1994). The importance of counseling has been emphasized by the U.S. Preventive Services Task Force (1996b). The basic science for patient behavioral change is maturing (Willey et al. 1996); however, most physicians are relatively ignorant about workable approaches and have not been trained in the requisite skills.
 9. When specific areas for clinical prevention services are examined closely, significant additional barriers frequently emerge. For example, Sugg and Inui (1992) interviewed primary care practitioners at Group Health Cooperative (GHC) and found that although these practitioners acknowledged the importance of domestic violence, they often hesitated to intervene for several reasons: fear of offending their patients, lack of self-efficacy, a personal sense of helplessness, a sentiment that domestic violence was not a medical problem, and lack of time.

Despite these barriers, systematic approaches to implementing clinical prevention services have been demonstrated to result in improved

health outcomes. Examples include control of hypertension (Tuomilehto et al. 1980; Nissinen et al. 1986); increased use of bicycle safety helmets (DiGuseppi et al. 1989; DiGuseppi, Rivara, and Koepsell 1990; Rivara et al. 1994); smoking cessation (Kottke et al. 1992); cancer screening and prevention (Taplin et al. 1990; Dietrich et al. 1992); general disease prevention (Belcher 1990); and the control of coronary heart disease risk factors following myocardial infarction (Miller et al. 1991). At Group Health Cooperative (GHC), systematic approaches have produced effective programs for breast cancer screening (Thompson et al. 1988b, 1989; Taplin et al. 1990); childhood immunizations (Payne et al. 1991, 1993); senior flu vaccine (Pearson and Thompson 1994); smoking cessation (Orleans et al. 1991; McBride, Curry, and Louie 1993; Britt et al. 1994); earlier detection and management of depression (Katon et al. 1995; Lin et al. 1995); cholesterol screening (Stuart et al. 1991); and increased use of bicycle safety helmets by children (DiGuseppi et al. 1989, 1990; Rivara et al. 1994; Thompson, Rivara, and Thompson 1989).

Over the last 20 years, we have sought to develop clinical prevention services by using population-based thinking, which is then focused at the level of the individual practice. Although we are pleased with some of our successes, we have not found the journey to be an easy one.

This article provides a discussion of empirical methods for guideline and program development and implementation and for the evaluation of clinical preventive services that have been created. The GHC philosophy of health care delivery, our vision for clinical prevention services, the overall program of services—the Lifetime Health Monitoring Program—the methods of selecting and analyzing issues, the development of guidelines and programs, and their implementation are reviewed. The goal is to provide a description of the elements that are central to creating and carrying out successful programs.

Setting

Group Health Cooperative of Puget Sound is a large staff-model HMO that began in 1947. GHC is the largest member-governed HMO in the country, with approximately 483,000 members throughout the greater Puget Sound area of Washington State and a total of 639,000 members in Washington and Idaho. It has 28 medical centers, owns two hospi-

tals, and leases space in two other hospitals in the Puget Sound area. More than 900 physicians are employed by GHC; approximately 40 percent of these are primary care physicians. The demographics of our membership are similar to the standard metropolitan statistical area (SMSA) by age distribution, sex, and race. Approximately 90 percent of members are Caucasian; 4 percent are Black; and 4 percent are Asian/Pacific Islander. Income is generally similar to the SMSA, although there are fewer GHC members at very high levels of income; the percentage of low-income individuals, however, is similar. The membership is highly educated, with 67 percent having more than a high school education, compared with 47 percent for the SMSA. As a consumer-governed cooperative, the organization emphasized "special attention to preventive medicine" in the preamble to the GHC bylaws written in 1946.

Methods

The critical elements for success in the development and delivery of clinical prevention services are discussed here. In the next section, examples of results that have been achieved will illustrate the importance of these elements to our success.

Philosophy of Health Care Delivery

The general objective of health care delivery at GHC is to optimize health status and enrollee satisfaction with care at reasonable cost and acceptable provider satisfaction. This objective is to be achieved through a collaborative process for planning and delivering health services to the population (Wagner 1992).

A philosophy for the delivery of clinical prevention services was noted by McKeown et al. (1968) of the Nuffield Provincial Hospitals' Trust and, more recently, was reiterated by Harold Sox (1994): Clinical prevention services, especially those geared toward secondary prevention, must be held to a higher standard of proof than is applied to sick patients with symptoms because, in the former case, the practitioner is seeking out the patient. The implicit message is: "We have something 'good' for you." This obligates the practitioner to be sure that the benefits exceed the harm (*primum no nocere*).

Vision for the Ideal Preventive Care System

A sense of overall direction is mandatory. For GHC, clinical prevention services are envisioned as having clear priorities whose outcome goals are specific and reflect evidence of effectiveness. The critical elements are listed in table 1.

Lifetime Health Monitoring Program

The naming of the clinical prevention services is important to their success because it affords a way to speak of them collectively. Although our program began in 1975, it is named after the work of Breslow and Somers (1977), who described "lifetime health monitoring" as incorporating early detection maneuvers and risk counseling within an epidemiological framework. Our schedule of recommended prevention visits represents a compromise between the desires of the public and the available science. It is a move away from the "annual physical examination" and toward a system of systematic risk assessment and counseling, provision of proven screening services, and immunizations.

The procedures for deciding which services to deliver are discussed below.

TABLE 1
Critical Elements for an Ideal Prevention Care Delivery System

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1. A population-based planning approach is used.
 2. The planning is directed to major causes of morbidity and mortality as epidemiologically determined. Consideration is given to the epidemiology of "needs" (the diseases and the risks) and the epidemiology of "wants" (the desires of the enrollees).
 3. Evidence of intervention effectiveness either is available or must be generated through well-designed program evaluation.
 4. The system functions at multiple levels: one-to-one level of primary care; infrastructural level of care; organizational level; and in the external community.
 5. The system is prospective and automated to the maximum extent feasible; for example, GHC actively seeks out persons who need immunizations and breast cancer screening.
 6. Health is the byproduct of shared decision making between practitioners and patients. Informed consent is maximized.
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An Organizational Focus for Clinical Prevention Services

To provide a leadership focus for clinical prevention services, GHC organized the Department of Preventive Care in 1975. This small department devotes considerable energy to preventive care guideline and program development, implementation, and evaluation work in concert with other divisions of the Cooperative: the Center for Health Promotion, the Center for Health Studies, the Department of Continuing Medical Education, and the Division of Clinical Planning and Improvement.

GHC established a Committee on Prevention (COP) in 1978 (Thompson, Carter, and Taplin 1989). The purpose of the committee is to provide a place for organizational dialogue on prevention issues and to develop guideline and program recommendations. The committee is staffed by primary care physicians, nurses, clinic managers, health educators, researchers, quality assessment managers, information systems personnel, writers from GHC's quarterly consumer magazine, lobbyists, and marketers. Subspecialists contribute on an ad hoc basis to issues in their area of expertise. The committee uses explicit criteria to evaluate primary and secondary prevention issues.

The process developed and utilized by the COP has proved very effective. Basically, we have formed a group of providers who are "writing their own guidelines" for what they should be doing. This task is performed with the assistance of the professional staff in three GHC departments: the Department of Preventive Care, the Center for Health Promotion, and the Center for Health Studies. The importance of provider involvement in producing the guidelines cannot be overestimated. After issues are investigated, COP-developed guidelines either are translated into standard practice or provide the impetus for forming new GHC programs.

Selection of Issues for Analysis

Among the major factors influencing the selection of issues for analysis by the COP are the following:

- Disease and risk factor epidemiology—disease burden
- New information from the medical literature on risk factors, screening methods, or interventions

- Issues uncovered by staff surveys or on a case-by-case basis
- Issues that surface in membership surveys or through focus groups
- Issues arising from national recommendations, such as those by the CDC on low-level lead toxicity in 1991
- Current patient outcome information
- Purchasers' requests
- Utilization patterns—usage patterns of medications, lab utilization, referral rates

Criteria Used to Examine Primary and Secondary Prevention Issues

The COP employs explicit GHC criteria in an evidence-based approach (table 2). Recognizing that the analysis will vary somewhat from issue to issue and depends on the scientific information available, the COP nevertheless requires that its reviews follow an adaptation of internationally recognized criteria (McKeown 1968; Wilson and Junger 1968; Frankenburg and Camp 1975; Canadian Task Force on the Periodic Health Examination 1980; U.S. Preventive Services Task Force 1996a).

The first four criteria provide a state-of-the-art view of screening for that condition or risk factor. The evidence is graded in a manner similar

TABLE 2
Criteria Used to Examine Primary and Secondary Prevention Issues

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1. Condition (disease/risk factor) is important. This is the concept of the burden of suffering caused by the condition.
 2. The disease or risk factor has a recognizable presymptomatic stage. Under this criterion, the natural history of the disease is described.
 3. Reliable methods exist for detecting the disease or risk factor. Considered here is screening test validity: sensitivity, specificity, and positive predictive value.
 4. Modification of the risk factor or therapy in the presymptomatic disease stage is more effective in reducing morbidity and mortality than treatment of the disease after symptoms appear.
 5. The facility or capacity to address the identified risk factor or condition exists.
 6. The cost and potential benefits of implementing a state-of-the-art approach have been considered.
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to that employed by the U.S. Preventive Services Task Force (USPSTF) (1996a), but GHC adds two additional steps that address the financial impact of implementing an ideal approach. When a guideline appears to carry major cost implications, the costs of implementing a state-of-the-art program are compared with the present situation at GHC. Depending on the magnitude of the issue and the available information, questions of cost effectiveness (Doubilet, Weinstein, and McNeill 1986) and cost benefit (Warner and Luce 1982) may be addressed (Carter et al. 1987). Economic analysis is generally employed either when the initial costs for making needed changes are likely to be large or in order to gain leverage in the organizational setting: for example, an argument that an intervention is effective and will save money in the long run is more convincing than the effectiveness argument alone. The end result of this process is a document ("white paper"), which forms the basis for our practice guideline or for developing a program.

Over the years, the COP has examined more than 100 issues, resulting in the development of major programs in ten areas, examples of which include immunizations, colon cancer screening, breast cancer screening, and the development and dissemination of more than 40 preventive care guidelines. Guidelines, as distinguished from programs, are recommended procedures that can initially be put into practice without major financial impact. Currently, as guidelines are developed, they are placed on clinical computer workstations in each physician's and nurse's work site.

Implementation of Guidelines and Programs

What Does Not Work. A comprehensive review of the continuing education literature in 1984 concluded that programs that simply impart knowledge do not change physician behavior (Davis et al. 1984). Observations from the Minnesota Heart Studies corroborated these findings for primary and secondary prevention of coronary artery disease. These researchers found that recruiting physicians only, as opposed to the whole health care team, and training them in patient counseling, with or without the use of patient education materials, was ineffective (Kottke, Brekke, and Solberg 1993).

Characteristics of Successful Implementation Strategies. Recently, reviews of the effectiveness of continuing education have been performed

by Davis, Thomson, Oxman and Haynes. After examining 777 references and reviewing the results of 99 randomized, controlled trials, they concluded that multifaceted practice strategies that enable the desired change in the practice to occur on site (using, for example, opinion leaders, patient-mediated interventions, reminders, outreach visits) and reinforcing (feedback) strategies seemed to hold great promise (Davis et al. 1992, 1995).

Our own experience and the work of Kottke led us to formulate a concept of the attributes of successful systems for implementing clinical prevention services are as follows:

1. Developing clear guidelines for the intervention and adequately training the staff to perform the necessary roles in undertaking it, possibly through workshops, role playing, and training videos (Kottke, Solberg, and Brekke 1990; Pommerenke and Dietrich 1992a,b; Davis et al. 1992; Kottke, Brekke, and Solberg 1993).
2. Systematically detecting patients who potentially need the service.
3. Advising such patients that action may be indicated.
4. Describing the benefits of action in terms that are meaningful to the patient. (We are beginning to apply the stages-of-change model in these discussions [Willey et al. 1996].)
5. Enabling and assisting the patient in decision making.
6. Reinforcing the patient's preventive behaviors and arranging follow-up.
7. Offering feedback of results to providers.
8. Structuring the practice environment so that it is conducive to the intervention.

Clearly automated clinical information systems will be an increasingly critical part of the delivery of high-quality clinical prevention services.

Conceptual Basis for the Intervention Model

To implement clinical preventive care services, we focus on the behavior of the providers on the team including doctors, nurses, physician's assis-

tants, nurse practitioners, pharmacists, medical assistants, and receptionists.

The conceptual basis for our intervention model comes from the work of Bandura and Fishbein (Fishbein and Ajzen 1975; Bandura 1977; Bandura 1978). The Precede/Proceed Model (Green et al. 1980; Green and Kreuter 1991; Walsh and McPhee 1992), based on Green's work, specifies three categories of factors that support behavior change: predisposing, enabling, and reinforcing (Green, Eriksen, and Schor 1988; Lawrence 1990). This model provides a convenient checklist for organizing and summarizing the critical elements. These are shown in figure 1.

Factors that Predispose Providers to Behavioral Change. Predisposing factors are those that influence a provider's willingness to change: the possession of—and the confidence (sense of self-efficacy) in—his or her skills to perform a task and the provider's knowledge, attitudes, beliefs, and personal health behaviors or experiences. Systematic training in early detection of disease and patient counseling for behavioral change are not taught in medical or nursing school to any great extent. They must be supplied through professional education. Although providers

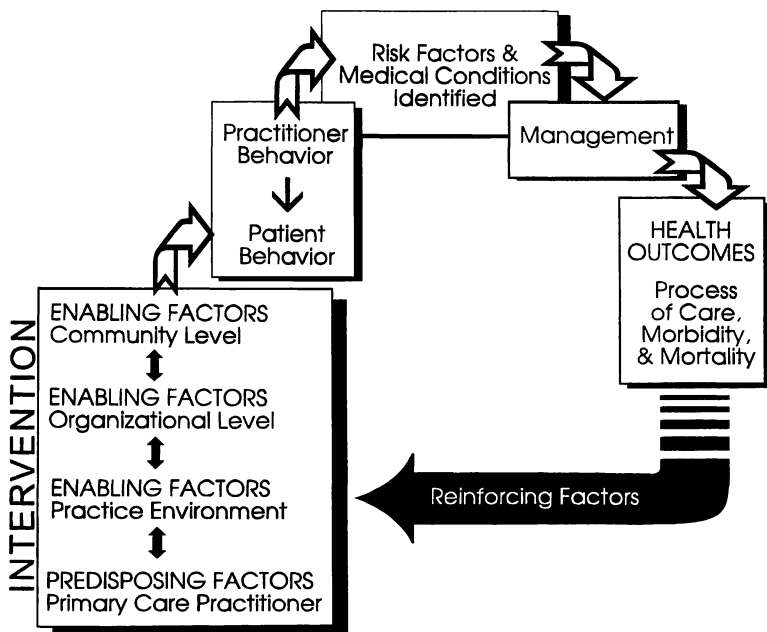


FIG. 1. Implementation model for clinical prevention services.

generally acknowledge the importance of clinical preventive services, they identify significant barriers to intervention.

Based on the literature and on our experience, GHC has singled out the following interventions for increasing practitioner predisposing factors:

- Identification of barriers through provider surveys and focus groups (Basch 1987; Ward, Bertrand, and Brown 1991)
- Participation of clinical leaders in program development and implementation (Weisbrod and Stoelwinder 1979; Thompson, Kirz, and Gold 1983; Carter et al. 1987; Thompson, Carter, and Taplin 1989)
- Involvement of providers in planning the implementation (Carter et al. 1987; Thompson et al. 1988b; Taplin et al. 1990; Katon et al. 1995)
- Training workshops (Wenrich et al. 1971; Eisenberg 1982b; Stross et al. 1983; Rich, Crowson, and Connelly 1985; Maiman et al. 1988; Katon et al. 1995)
- Practice rehearsal, including role playing

These strategies were devised to identify barriers, to work them through, and, above all, to increase providers' sense of self-efficacy. Approaches using these measures have improved pediatricians' practices, launched smoking cessation initiatives, and improved management of depression in primary care practice (Maiman et al. 1988; Glynn and Manley 1991; Lin et al. 1995; Katon et al. 1995).

Factors That Enable Behavioral Change. Enabling factors are those in the practice, organizational, and community environment that make change possible.

Enabling factors in the *practice environment* include possession of the skills to perform the task and a supportive infrastructure to accomplish it. The importance of the practice environment for behavioral change has been clearly demonstrated (Bandura 1977, 1978; Green, Eriksen, and Schor 1988; Winett, King, and Altman 1989; Lawrence 1990; Perry, Baranowski, and Parcel 1990).

Changes in procedures and support have increased the application of preventive services in office practice. Examples are listed below:

- Reminders directed to providers or patients (Brimberry 1988; Larson et al. 1979; Larson et al. 1982; Vallez et al. 1985; Thompson et al. 1986; McDowell, Newell, and Rosser 1986, 1989; Mullooly 1987; Leininger et al. 1996)
- Delegation of activities (Frame, Kowulich, and Llewellyn 1984)
- Administrative rules (McGowan and Finland 1974; Durbin, Lapidus, and Goldmann 1981; Vayda and Mindell 1982; Ruchlin, Finkel, and McCarthy 1982; Martin et al. 1982; Gryskiewicz and Detmer 1983; Wong, McCarron, and Shaw 1983)
- Presence of local community standards or norms (Pineault 1976; Zelnio 1982; Dorsey 1983; Hartzema and Christensen 1983; Epstein, Begg, and McNeil 1983; Williams and Williams 1987)
- Flow sheets, checklists, brief scripts as primary care "tools," or guidelines (Cohen et al. 1982; Prislín, Vandenbark, and Clarkson 1986; Madlon-Kay 1987; Cheney and Ramsdel 1987; Shank, Powell, and Llewelyn 1989; Dietrich et al. 1992; Johns et al. 1992; Britt et al. 1994)
- Exam room posters (Lane, Polednak, and Burg 1991; Savage 1991)
- Stickers affixed to charts identifying patient's health risks. The concept of smoking status as a vital sign is one example (Cohen et al. 1987, 1989; Solberg et al. 1990)
- Resource lists for patients
- Forms for contracting with patients for behavioral change (Kottke et al. 1988)
- Careful attention to physical layout and patient flow (Pommerenke and Dietrich 1992a,b)
- Follow-up phone calls (Lerman et al. 1992)

Our empirical experience at GHC indicates the importance of systematically assessing patient risks and screening needs and the utility of topic-specific posters in patient waiting areas—as a way of “giving permission” to patients to discuss difficult issues like domestic violence, drug use, or guns in the home. For example, in a study we are presently conducting on improving identification and management of victims of domestic violence (DV), four patients in four months have identified themselves to the clinical staff because of DV posters prominently displayed in the practice setting. Discussions using detailed, written listings of the pros and cons for controversial issues (like the use of the prostate-

specific antigen test to screen for prostate cancer), other written educational materials (such as self-help materials for smoking cessation or exercise initiation), and resource lists (for example, on how to utilize GHC's breast cancer screening program) are all useful.

In the *organizational environment* enabling factors include the organization's overall support and commitment to service delivery. Examples from our experience include the following:

- Encouraging expressions of organizational commitment by the CEO and the medical director from their "bully pulpit" to promote clinical prevention services, use of their newsletters, and their general endorsements
- Promoting institution-sponsored activities, such as fun runs, smoke-outs, low-fat diet days, provision of low-cost bicycle safety helmets
- Providing funds for pilot projects to test various clinical prevention services
- Identifying a focus or department for preventive care and health promotion activities within the organization
- Establishing and placing in the organizational decision-making structure a forum, like GHC's Committee on Prevention, for analyzing issues, establishing guidelines, and developing programs
- Designing postgraduate educational programs to foster specific or general skills for identifying risks and diseases and for changing patient behavior through use of the powerful tools of role playing or video scenarios
- Involving staff in research activities for prevention and health promotion, which is a form of on site, "hands-on," continuing education integral to many of our studies
- Integrating steps to improve prevention services with activities designed to improve the quality of care for other clinical issues
- Taking advantage of the opportunity for advancing clinical prevention services afforded by official accreditation activities, such as reviews by the Joint Commission for the Accreditation of Healthcare Organizations and the National Committee on Quality Assurance
- Developing and integrating clinical information systems into day-to-day health care delivery

Enabling factors in the *community* include organizational leadership and participation in:

- Community coalitions, campaigns, and demonstration projects
- Collaborations with university-based researchers and public health agencies
- Educational appearances on radio, TV, and at town meetings
- Contributions to the print media
- Participation in policy development for health at the local, state, and national levels

Reinforcing Factors for Provider Behavioral Change. Reinforcing factors reward and strengthen behavioral change and put a “face” on clinical prevention results. They include peer support, feedback from patients and colleagues, individual provider stories about results, and feelings of competency in dealing with a problem. Reinforcement is critical to clinical prevention services because evidence of effect is rare, often invisible unless quantitated, and very important in motivating change (Lawrence 1990). Personal and individualized feedback that takes place in a professional setting with peer comparisons and is delivered by a professional leader or, in some instances, by computer, can be especially reinforcing (Schroeder et al. 1973; Griner 1979; Hillman et al. 1979; Young 1980; Check 1980; Myers and Schroeder 1981; Eisenberg and Williams 1981; Eisenberg 1982a; Rosser 1983; Thompson, Kirz, and Gold 1983; Wong, McCarron, and Shaw 1983; Fineberg, Funkhouser, and Marks 1983; Winickoff et al. 1984; Gehlbach et al. 1984; Marton, Tul, and Sox 1985; McPhee et al. 1989; Nattinger, Panzer, and Janus 1989). Feedback of group data on rare outcomes and peer support have proved effective (McPhee et al. 1989; Lawrence 1990).

Examples of reinforcing factors include:

- Feedback of “war” stories from colleagues and patients
- Feedback of results—immunization levels, mammography rates, and so forth
- Awards for recognized activity in clinical prevention services like the Preventive Care Scholar’s award established by GHC

Table 3 summarizes the critical strategies for implementing clinical prevention services that target physician behavioral change. Successful systems deploy the skills of the entire health care team, use the practice infrastructure to support service delivery, are proactive in anticipating the services that will be needed, and provide appropriate information

TABLE 3
Critical Strategies for Implementing Clinical Prevention Services

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- A. *Predisposing factors*
1. Barrier identification
 2. Practitioner involvement in planning
 3. Training for practice integration (workshops, role playing, videos)
- B. *Enabling factors*
- B1. Practice level
1. Clear guidelines
 2. Reminders
 3. Chart stickers/flags
 4. Patient flow planning
 5. Organized follow-up
- B2. Organizational level
1. CEO and medical director commitment
 2. Organizational locus for clinical prevention services development and implementation planning
 3. Postgraduate educational programs directed to physician skill development, practice, integration, and patient behavior change
 4. Staff involvement in research and evaluation projects of clinical prevention services
 5. Automated clinical information systems
- B3. Community level
1. Community coalitions
 2. Collaboration with university-based researchers and/or public health agencies
 3. Community policy development
- C. *Reinforcing factors*
1. Personalized feedback
 2. Newsletters
 3. Awards
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before, at the beginning, during, and after a visit and as part of any outreach for services that are indicated for nonutilizers in the practice population.

Results

In this section, some of our experiences in applying the principles are summarized.

Program evaluation is an essential function after development and implementation. From evaluation comes the critical information for feedback, reinforcement, and assessment of effectiveness. Broadly speaking, three areas of results are considered, as shown in table 4.

Over the years, GHC has developed population-based approaches to *increase* and improve clinical services for certain types of primary and secondary prevention:

- Breast cancer screening (Thompson et al. 1988b, 1989, 1995; Taplin et al. 1990)
- Childhood immunizations (Payne et al. 1991, 1993)
- Influenza vaccine in seniors (Pearson and Thompson 1994)
- Tobacco use cessation (Orleans et al. 1991; McBride, Curry, and Louie 1993; Britt et al. 1994)
- Depression (Katon et al. 1995; Lin et al. 1995)
- Lead toxicity (R. S. Thompson and V. Immanual 1991–94, unpublished)
- Cholesterol screening (Stuart et al. 1991)
- Head injuries due to bicycling (DiGuseppi et al 1989; Thompson, Rivara, and Thompson 1989; DiGuseppi, Rivara, and Koepsell 1990; Rivara et al. 1994)

Application of these approaches may also *decrease* or discourage the use of screening tests of no or unproven value:

TABLE 4
Program Evaluation End Points

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- Barrier reduction—measures of attitudes, knowledge, and beliefs of practitioners or patients
 - Process of care measures—measures of screening tests performed, identification of risks, counseling directed to behavioral change, and medical care utilization
 - Health outcomes: for disease screening, possibly a decrease of late stage disease incidence or decreased mortality; for other outcomes, changes in risks, health status, or shifts in the proportion of patients in the various categories of the behavioral change continuum, perhaps from precontemplation to active contemplation
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- Multichannel blood tests (Thompson, Kirz, and Gold 1983)
- Chest X rays in asymptomatic adults (Thompson, Kirz, and Gold 1983)
- Prostate-specific antigen (PSA) for prostate cancer detection (Stuart et al. 1992; Handley and Stuart 1994; Mandelson, Wagner, and Thompson 1995)

Our experiences with increasing immunizations, decreasing tobacco use, increasing bicycle safety helmet use, and decreasing or discouraging use of multichannel blood tests or chest X rays in asymptomatic adults and the PSA screening test are described below. The references listed above describe the other programs we have cited.

Increasing the Use of Proven Clinical Prevention Services

Automated Recording and Tracking System for Immunizations in the GHC Population

This area was identified as a priority by the Committee on Prevention in 1988–89. We applied for and were awarded a contract with the Centers for Disease Control and Prevention to study complications of childhood immunizations. This provided the impetus we needed to automate all GHC immunizations.

The automated immunization system was begun in 1991. We are able to generate automated data on members of a given age who are adequately immunized (the positive predicted value, or PPV, of automated data 99 percent) as well as those who are apparently deficient (negative predictive value, or NPV, 50 percent). These data, which focus on children, are fed back to individual practices and clinics on a regular basis, as a part of regional quality assurance activities, and children who are truly deficient are asked to come in. Immunizations that have not been recorded (i.e., the reason for the low NPV) are entered into the system. Using this approach of continuous feedback in GHC's 28 medical centers, we have been able to generate a healthy competition among medical centers and between regions to see "who can be the best." As shown in figure 2, in successive cohorts of 23- to 25-month-old children, complete immunization (the 4:3:1:1 series) was achieved in excess

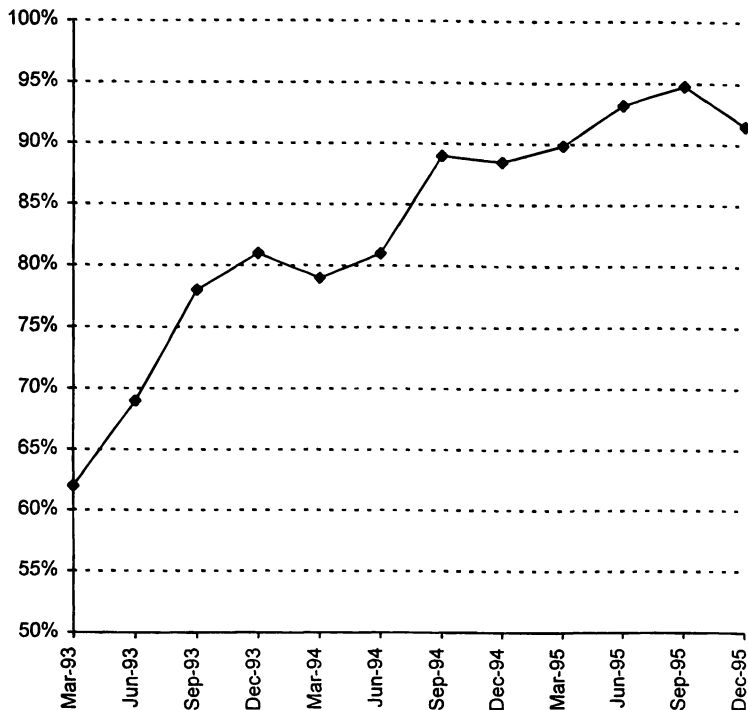


FIG. 2. Complete (4:3:1:1 series) immunizations among continuously enrolled Puget Sound area Group Health Cooperative two-year-olds by quarter. Chi-square trend test = 411.1; $p < .001$.

of 90 percent in each of the last three quarters of 1995 and for the year. The increase from third-quarter 1993 (62 percent) to 1994 (89 percent) to 1995 (94.8 percent) is gratifying. This example of continuously enrolled Puget Sound quarterly cohorts of two-year-olds (approximately 500 to 600 per quarter of this age group) was chosen to indicate the pattern of steady, incremental increase in immunization levels since the first quarter of 1993 as a result of the strong, ongoing quality-assurance and feedback activities.

HEDIS (Health Plan Employer Data and Information Set) report card levels for complete immunizations (the 4:3:1:1 series) for all continuously enrolled GHC two-year-olds in western Washington was 78.8 percent in 1993, 87.2 percent in 1994, and 91 percent in 1995. For Medicaid GHC enrollees only, the rate for the year ending in March 1995 was 82.6 percent. When the recent CDC definitions of complete (4 DTP / 3 polio / 1 MMR—the 4:3:1 series, or 4 DTP / 3 polio / 1

MMR / 3 HIB—the 4:3:1:3 series) are used for the year 1995, the GHC results are essentially identical to those in figure 2 (Centers for Disease Control and Prevention 1996).

Completion rates of immunizations for two-year-olds, utilizing several different definitions of “complete” at GHC and in relevant geographic areas, are compared in table 5. In general, GHC’s completion rates are substantially higher than the comparison rates.

Predating the automated immunization system, but benefiting from it since 1992, is a campaign to increase rates of influenza vaccine for GHC members who are 65 years of age and older. Every fall an intensive flu campaign is conducted with the help of volunteers in each medical center (Pearson and Thompson 1994). Flu vaccine rates over the years for this age group are shown in figure 3. The GHC rate of 66 percent in 1991 can be compared with a national rate of 42 percent for that year.

The critical components of the immunization interventions, as outlined in table 3, include A–1,2; B1–2, 5; B2–1,2,4,5; B3–1,2; C–1, 2. In the community, GHC has participated in a large coalition to reduce vaccine-preventable disease (the Johnson Foundation’s “All Kids Count”

TABLE 5
Complete Immunizations in Two-Year-Olds

Site	Immunization series defined as complete ^c	Time period	
		April 1994– March 1995	1995 (year)
GHC–Western Washington ^a	4:3:1:1	87.2%	91%
GHC–Puget Sound	4:3:1:3	—	92.6
State of Washington ^b	4:3:1	75	—
	4:3:1:3	73	—
King County (Seattle area) ^b	4:3:1	78	—
	4:3:1:3	74	—
National ^b	4:3:1	75	—
	4:3:1:3	72	—

^a Data derived from the Group Health Cooperative of Puget Sound HEDIS Reports.

^b Data derived from Centers for Disease Control and Prevention (1996).

^c Series definitions: 4:3:1 = 4 DTP, 3 polio, 1 MMR; 4:3:1:1 = 4 DTP, 3 polio, 1 MMR, 1 HIB; 4:3:1:3 = 4 DTP, 3 polio, 1 MMR, 3 HIB.

Abbreviations: DPT = diphtheria, pertussis, and tetanus; polio = oral or injectable polio vaccine; HIB = *Hemophilus influenzae* type B; MMR = measles, mumps, and rubella.

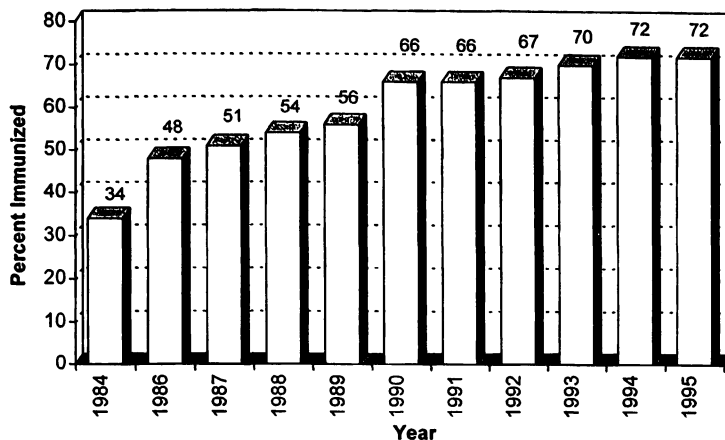


FIG. 3. Influenza immunization rates by year, for individuals 65 years of age and older, at the Group Health Cooperative.

program). GHC is providing consultation in the development of automated vaccine registries, since our experience dates from 1991. GHC has supplied free vaccine to underserved communities.

Decreasing Tobacco Use

GHC has been active in this area for many years (Thompson et al. 1988a; Orleans et al., 1991; McBride, Curry, and Louie 1993; Britt et al. 1994). GHC banned smoking from its clinical facilities in 1982. The efforts have proceeded on several levels, from improvement of cessation programs and increased access to them, clinic-based identification and intervention (smoking as a vital sign) with smokers, to community-based efforts to affect policy.

Critical components of intervention efforts, as delineated in table 3, include A-1,2,3; B1-1,3,4,5; B2-1,2,3,4,5; B3-1,2,3. Worthy of mention are the smoking cessation program ("Free and Clear"), which research performed at GHC has shown to be effective (Orleans et al. 1991); the adoption by GHC in 1993 of this program and of nicotine patches as a regular covered benefit; the use of chart stickers to make smoking a "vital sign"; and extensive participation in community efforts.

In the clinical arena, the NCI's "ask, advise, assist, and arrange" method (4-As) has been promulgated (Glynn and Manley 1991) by

numerous workshops for physicians and other staff, including role playing, and by multiple brief presentations at other medical education events. Other provider-changing approaches, such as academic detailing, easy accessibility of patient self-help materials in exam rooms, and positive feedback loops for referral of patients to cessation programs, have also been employed.

In 1993, medical coverage for GHC's Free and Clear cessation program (Orleans et al. 1991) and for nicotine replacement therapy used in conjunction with the program was instituted. A self-help quit manual, "Clearing the Air" (McBride, Curry, and Louie 1993), was developed for use in the program, which includes eight individual (telephone) or group-counseling sessions (Britt et al. 1994). The treatment services (i.e., Free and Clear) are woven into the clinical tobacco interventions so the two arenas mutually complement each other. For example, the largest referral source identified by participants in the Free and Clear program (N=1,500) has been physicians. The physician team receives multiple updates informing them of their patient's progress, but their required interaction becomes manageable by, for example, the support of a built-in centralized nursing phone call to all patients one week after initiation of nicotine replacement therapy.

Early evaluative results indicate a 20-fold increase in the use of the self-help manual (13,500 in 1993), an 11-fold increase in Free and Clear program participation (2,000 participants in 1993), and cessation rates (complete abstinence for at least one month, one year after the program) of 29 percent for the individual telephone approach and 31 percent for the group approach. There were 1,791 Free and Clear program participants in 1994; 1,501 in 1995; and 494 in the first quarter of 1996, which annualizes to 1,976. Quit rates defined as above are approximately 30 percent.

GHC's CEO, physicians, and lobbyists played a critical role in defeating a "smoker's rights" bill in the Washington state legislature. GHC provides office space for Washington-based Doctors Ought to Care (DOC), a physician-directed, antitobacco advocacy group. GHC staff members were instrumental in establishing a large coalition of community groups that convinced the *Seattle Times* to stop accepting tobacco advertisements.

GHC expects to meet or exceed its target for the year 2000 of no more than 12.5 percent smokers. Cigarette smoking prevalence in GHC adults

20 years of age and older was 25 percent in 1985, 20 percent in 1990, and 15.5 percent in 1994. The Washington state figures were 23.7 percent in 1987, 22.4 percent in 1990, and 21.8 percent in 1993–94. The rate of decrease per year is 0.95 percent at GHC, which is considerably more rapid than the Washington state rate of 0.24 percent per year in this period.

Promotion of Bicycle Safety Helmet Use in Children

Critical components of this intervention, as described in table 3, have included A–1,2; B1–3; B2–2,4; B3–1,2,3; and C–2. Of note was the synchronous development of a broad, ongoing community campaign (Bergman et al. 1994) informed by research on barriers to safety helmet use (DiGuseppi, Rivara, and Koepsell 1990) and bicycle helmet efficacy (Thompson, Rivara, and Thompson 1989; D. C. Thompson et al. 1990); and cost-effectiveness (Thompson et al. 1993); the development of a broad-based community coalition (18 different groups) (Bergman et al. 1994); cut-rate coupons for bicycle helmets; an extensive media campaign; and the adoption of the Seattle approach, developed for national use by the American Academy of Pediatrics.

The community campaign was initiated by the Harborview Injury Prevention and Research Center in 1986. GHC has been an active research and campaign collaborator. GHC's clinical activities have included distributing cut-rate helmet coupons through offices since 1987, using "Wear a Bicycle Helmet" lapel badges, and in 1993 conducting a very low cost (\$15) campaign to increase helmet usage rates.

Participation by primary care physicians in distributing the coupons for cut-rate helmets was a significant campaign feature. Redemption rates of these coupons were twice as high (12 percent) as through other methods (Bergman et al. 1994). The latest results of the continuous community and office-based campaign are shown in table 6.

The 67 percent decrease in head injury rates at GHC, compared with the 14 to 26 percent decrease in other injuries from 1987 to 1992, indicates that use of helmets was the major cause of the head injury decrease (Rivara et al. 1994), not decreased ridership, as some in Europe have suggested.

TABLE 6
Bicycle-Related Injuries and Safety Helmet Use in 1987 and 1992:
Group Health Cooperative of Puget Sound

	Injuries per 100,000		Decrease (%)
	1987	1992	
<i>Bicycle-related injuries</i>			
Five- to nine-year-olds			
Head injuries	283	94.6	66.6
Nonhead injuries	388	335	13.7
All injuries	671	429	36.1
Ten- to 14-year-olds			
Head injuries	188	60.9	67.6
Nonhead injuries	621	460	25.9
All injuries	809	521	35.6
Head injuries, % of total injuries	32.1	16.4	48.9
<i>Helmet usage rates (%) in GHC children</i>			
<15 years of age ^a	4.3	48	

^aFrom injured cyclists making an emergency department visit.
Source: Adapted with permission from Rivara et al. (1994).

Decreasing the Use of Ineffective or Unproven Clinical Prevention Services

Multichannel Blood Tests and Chest X Rays as Screening Tests at Physical Examinations

The systematic approach to guideline development as applied by the Committee on Prevention can be used in instances where it is desirable to decrease the use of a screening test. In 1978 the COP concluded, based on the evidence, that neither 12-channel blood tests nor chest X rays at routine physical exams were useful screening procedures (Thompson, Kirz, and Gold 1983). Critical components of the intervention (table 3) included items A-2, B1-1, B2-2, and C-1. An educational-campaign targeted to physicians was mounted based on this guideline. The results are shown in table 7.

This campaign was associated with a fivefold decrease in chest X rays and a twofold decrease in multichannel blood tests. Estimated savings were \$167,000 in 1980 dollars (Thompson, Kirz, and Gold 1983).

TABLE 7
Multichannel Blood Tests and Chest X Ray Use at Physical Exam
before and after Campaign 1978-79

Screening procedure	1975-76 (%)	1979-80 (%)
Chest X ray	30	6
Multichannel blood tests	36	18

The PSA Test for Prostate Cancer Screening

A similar approach was begun in 1991 to decrease use of the PSA test for the early detection of prostate cancer in asymptomatic men because it is of unproven benefit and carries significant risks for those with positive test results (Sox, 1994; Handley and Stuart 1994; U.S. Preventive Services Task Force 1996a). The critical elements of our approach to PSA testing (table 3) were: A-1,2,3; B1-1.; B2-2,3,5; B3-2,3; and C-1,2. The COP examined this test and found questionable test specificity, poor positive predictive value, and no evidence that its use as a screening tool provided any benefits. The committee issued a guideline and implemented it by mounting a campaign which began with a half-day workshop for clinical leaders from all 28 outpatient clinics. A practice "tool" consisting of a detailed and referenced discussion of the pros and cons was developed for practitioners to use as "informed consent" in discussing the issue with patients (Stuart et al. 1992). A quarterly project newsletter provides feedback of coopwide, regional, medical center, and individual practitioner-level cumulative and incremental PSA testing rates for men ≥ 50 years of age. New literature is summarized in the newsletter. Figure 4 shows PSA testing rates by age from 1990 to 1993. Cumulative PSA testing had reached 25 percent of the ≥ 50 year old male population by the end of 1993. The campaign was initiated in October 1991 in the wake of a paper published in April by Catalona et al. (1991) and issuance of the COP's guideline on PSA in the summer of 1991. We ascribe some of the drop in testing after December 1991 to our campaign. This conclusion is independently corroborated by the work of the local cancer registry (1994), which found that only 2.1 percent of GHC primary care physicians reported routinely ordering PSA screening for males 50 years and older, compared with 76 percent

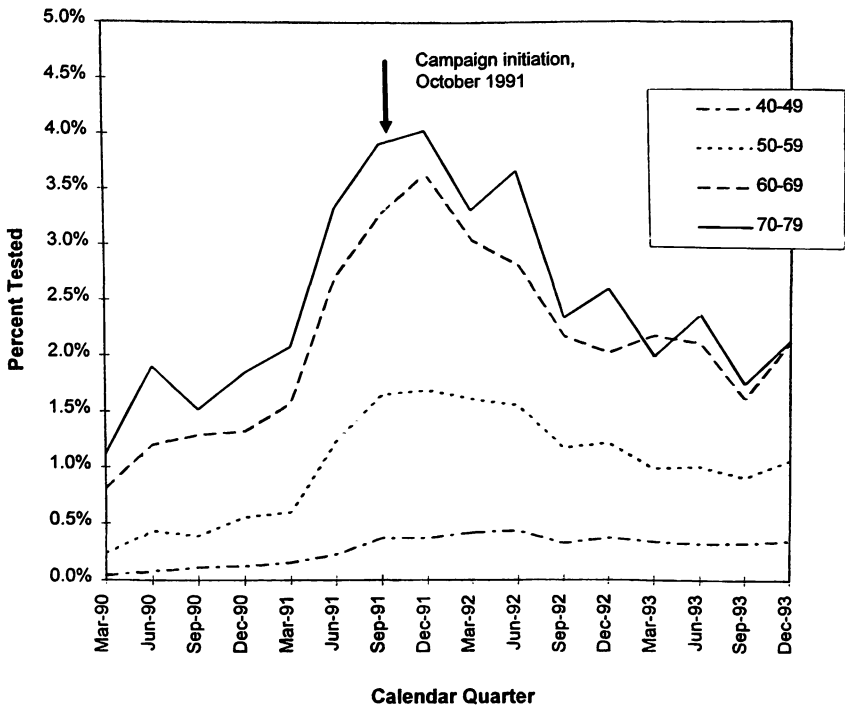


FIG. 4. Frequency of PSA testing in males aged 40 to 79 by primary care physicians at the Group Health Cooperative of Puget Sound from 1993 to 1994. *Source:* Adapted with permission from Mandelson, Wagner, and Thompson (1995).

of other primary care physicians in the state (Kerstin Edlefsen and Nicole Urban, May 1995: personal communication).

Discussion

Lessons Learned

What have group- and staff-model HMOs learned about the development, implementation, and evaluation of clinical prevention services? Group- and staff-model HMOs, as social experiments with their own cultures, are uniquely positioned to intervene on organizational and community levels in ways that fee-for-service, or the newer "managed care" network models of health care delivery, will find difficult to duplicate. More specifically, the organization's ability to support physicians in producing behavioral change by facilitating risk factor iden-

tification or introducing other clinical services—along with integrated and readily available referrals, programs, and telephone counseling, or other interventions, followed by tracking and patient follow-up and result feedback—is one of the great, if imperfectly realized, strengths of group- and staff-model HMOs.

Our empirical experience indicates the key components for success:

1. The use of a *population-based, epidemiological approach* is critical in deciding which issues to focus on. Included here are both the epidemiology of “need” (the disease or risk factor burden in the population) and the epidemiology of “want” (what the members feel the important issues are). Programs or guidelines developed on the basis of intersection between both lines of evidence have the best chance for later success.

2. The use of *explicit, criterion-based approaches* to examine the evidence for diseases or risks provides a sound, apolitical basis for decision making. The approach developed by GHC is one example, and, more recently, the approach utilized by the U.S. Preventive Services Task Force has been helpful in sorting out the confusing literature and the unclear and contradictory recommendations made by various advocacy, trade, and professional groups. Let the user “beware” recommendations emanating from groups that do not use explicit evidence-based criteria.

3. *Program or guideline implementation is a major challenge.* Front-end caveats to consider are that any intervention to change physician behavior should provide the practice team with “tools” to help them do a better job; should be substitutive rather than additive whenever possible; and should provide clear roles for and involve all members of the health care team. Surveys or focus groups to delineate major barriers are critical to success. This permits the interventions to be designed to address the barriers. Finally, we have found the PRECEDE/PROCEED model developed by Green and Kreuter (1991) to be an excellent checklist to use for developing an intervention strategy that focuses on provider-team predisposing factors and on enabling factors in the practice environment, the organizational environment, and the broader community. Finally, reinforcement must be built into the process because the results of clinical prevention activities are “hard to see.” Reinforcement may take the form of small group and individual feedback via clinical leaders’ newsletters or presentations and may incorporate financial incentives for goals reached.

4. *Critical elements in developing intervention strategies for patients* include the use of models to assist in thinking the process through. We have

found the 4-As model—Ask, Advise, Assist, and Arrange follow-up (McGinnis and Foege 1993)—or the transtheoretical model (Willey et al. 1996), when combined with Prochaska's stages-of-change model (Prochaska and Clemente 1992), to be helpful in describing the key features of patient interventions. A second key element is the use of shared decision making with patients through, for example, the use of videos to explain complex issues, or tersely written and tightly referenced pieces, which can be especially effective for laying out the pros and cons of controversial or confusing issues. Finally, the resources from different levels of the organization should be drawn on to support the practice teams and to help the changes occur. This attribute of group- and staff-model HMOs is one of their unique strengths. For example, the smoking cessation program at GHC utilizes physician counseling according to the 4-As and the stages-of-change models, but when the person chooses to quit with the help of GHC's "Free and Clear" program, he or she receives from six to eight follow-up and counseling phone calls from our centralized Center for Health Promotion, which also supplies feedback to the referring health care team.

5. *Outcome measures* of changes in knowledge, attitudes, and beliefs, and of process and impacts on health should be appropriate to the issue at hand and closely tied to the aims of the program or guideline. These data are used as feedback for providers and are critical to ongoing institutional quality-improvement efforts.

6. *Clinical computing resources are crucial for driving the process.* This includes patient invitations, tracking, and generating reminders to patients and/or provider teams, depending on the issue. Clinical computing provides the basis for practicing true population-based medicine by making calculation of rates and the practice of outreach possible.

7. *Because dollars for clinical prevention services are hard to find,* an entrepreneurial spirit on the part of those who would undertake these endeavors is necessary. Raising adequate funds is a challenge to HMO leaders during the transition from an emphasis on *medical care* to a focus on *health care*. Our hospitals are becoming empty; an epidemic of health is upon us!

Challenges for the Future

The future is likely to include large organizations with providers in diffuse networks, increased use of high technology for communication and diagnosis and therapy, and in which the coin of the realm for providers

will be their cost-effectiveness and the degree to which they can assume the responsibility for a defined population of patients. According to Greenlick (1995), population-based medicine will have fully arrived by 2005. Some of the challenges we face in reaching this goal are described here:

1. The continued development and implementation of *automated data systems for managing clinical care* is one key area. Such systems must capture not only the population cared for, but also the outcomes, risk factor information, exposures to screening maneuvers or counseling, and, ideally, overall medical care utilization. At GHC we have made good progress in this direction, but only two systems, breast cancer and immunization, are presently population-based and proactive. A pilot linking all of GHC's automated databases into a usable format for clinical daily practices is underway at one center and holds great promise for the population-based management of individual practice panels (1,800 patients) (Payne et al. 1995).

2. *Funding for clinical prevention services* is inadequate and will likely continue to be so, even in prepaid health systems like our own, under the present operational paradigm. Kottke states the problem succinctly: "medical care responds to complaints and urgency generated by patients rather than severity for the long term" (Kottke, Brekke, and Solberg 1993). The problem with clinical prevention services is that the results, like the 32 percent decrease in late stage breast cancer disease in our population of women, are displayed in numbers. This type of faceless numerical result cannot compete with the symptomatic patient who appears in our hospital or medical center or before our administrators, asking for a lung or heart transplant. In order to take the next major step in improving clinical prevention services, it will be necessary to earmark revenues—perhaps a small percentage of the members' capitation dues—to be devoted to clinical prevention services. Another promising approach is to link health care team (MD, RN, LPN, MA, receptionist) monetary support to the achievement of goals like immunization levels, smokers counseled and quit rates, patient satisfaction, and health care team satisfaction with each other. Finally, as population-based approaches to care delivery focused on long-term outcomes proliferate, they may provide more justification for funding clinical prevention services.

3. Another area for future development and application is *informed decision making for the patients*. Patients must be involved in their own health care and in the management of their health. In order to do this,

rigorous informed consent needs to be better applied. Areas with potential for such application at this time would be the use of the PSA test for prostate cancer screening or mammography screening in women aged 40 to 49 for breast cancer. A video approach, like the one developed by Wennberg and his colleagues, has helped patients to sort out options for the treatment of benign prostatic hypertrophy (Wagner et al. 1995). It shows promise for applicability to other areas, including clinical prevention services, especially those that are either not efficacious or are controversial at best.

4. Organized *self care* may be viewed as secondary prevention leading to the early identification and management of symptoms and illnesses by informed patients. David Sobel (1995) argues that 80 percent of all medical care is provided by the patients themselves; therefore, increasing their skill and confidence in what they can do will improve their health outcomes. He further argues that empowering patients must take two avenues: (1) arming patients with the knowledge and confidence to deal with many more day-to-day disease and health situations; and (2) increased emphasis on cost-effective psychosocial interventions because approximately 80 percent of patients' presenting symptoms in medical care are due to emotional distress and suffering, not to organic disease. His reviews of "self-care" for organic medical indications, and for underlying psychosocial distress, challenge many of our historic basic assumptions about the "practice of medicine" (Sobel 1995).

5. Most physicians practicing now were not trained in the psychological sciences needed for effective counseling to bring about *patient behavioral change*. Physicians must become adept at the science of patient behavioral change strategies and must have easily accessible follow-up information available for the patients served. The National Cancer Institute's 4-A's approach—ask, advise, assist, and arrange followup—to smoking cessation provides a promising model for application to other areas as well (Glynn and Manley 1991; McAfee et al. 1995). A review by Willey and colleagues (1996) makes the case for the applicability of the transtheoretical model to a wide variety of behaviors: smoking cessation, quitting cocaine use, weight control, reducing dietary fat, adopting sensible alcohol use patterns, practicing safe sex, limiting sun exposure, changing a sedentary lifestyle, and mammography screening.

Group- and staff-model HMOs have made significant progress in designing and implementing clinical prevention services in the last 20 years; however, we have a long way to go before we achieve our ideal vision.

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