

Tools, Teamwork, and Tenacity: An Office System for Cancer Prevention

Patricia A. Carney, RN, MS; Allen J. Dietrich, MD; Adam Keller, MPH; Jeanne Landgraf, MA; and Gerald T. O'Connor, PhD, DSc

Seattle, Washington, and Hanover, New Hampshire

Background. Despite national priorities in cancer control, the number of people with established ongoing medical care who do not receive indicated preventive services is substantial. Proven strategies to optimize preventive care in community practice are limited.

Methods. In the Cancer Prevention in Community Practice Project (CPCP), 50 primary care providers were randomly assigned to receive an "office system" intervention. The intervention led to reorganization of office operations based on four functional core components: identifying patients' needs for services; monitoring their status over time; providing positive reinforcement to patients; and establishing an internal feedback component consisting of a brief audit to assess how the system is operating. Implementation of the CPCP system in each practice was accomplished using trained facilitators, and involved incorporating one or more tools developed to meet the functional components of the practice.

Results. One hundred percent of the practices were successful in implementing some changes in their office

operations that met CPCP office system functional criteria. All study practices implemented customized flow sheets, while use of other office system tools were incorporated at between 32% to 75% of study sites. Identifying patients in need of preventive services was performed most often by the clinical staff (39%), whereas monitoring patients' receipt of preventive services over time and reinforcing positive patient behavior were performed most often by physicians (63% and 46%, respectively). Changes made in practices were maintained for at least 12 months.

Conclusions. Primary care practices in community settings can implement significant and lasting changes in their practice environment that will improve their performance of preventive activities. The functional components of the CPCP office system design proposed and tested here are applicable to a wide variety of practice settings.

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The challenge of controlling cancer by early detection and prevention is an appropriate task for primary care providers. The National Cancer Institute's Working Guidelines¹ and the US Preventive Services Task Force² provide direction in this area. While many physicians agree with these recommendations, only about one half provide them to asymptomatic patients.³ Altering this situation by changing physician behavior is a difficult task.⁴ Barriers to cancer control in primary care practice include attitudes and lack of knowledge on the part of

physicians and their patients, and skills, confidence, interest in prevention, time, support services, and reimbursement.⁵⁻⁷ To overcome these barriers, reminder systems have been shown to be efficacious. These, however, have most often been implemented in training settings so their generalizability may be limited.⁸⁻¹³

Developing and implementing interventions to ensure the performance of preventive services in routine primary care practice requires an understanding of these obstacles in practice settings where the focus is commonly disease treatment. The Cancer Prevention in Community Practice Project (CPCP) developed a systematic multi-component approach to address the obstacles described above and implemented it in 50 New Hampshire and Vermont primary care practices. The office system intervention developed in the Cancer Prevention in Community Practice Project was a manual

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From the Department of Community Health Care Systems, University of Washington, Seattle (P.A.C.); and the Departments of Community and Family Medicine (A.J.D., A.K., J.L., G.T.O.) and the Department of Medicine (G.T.O.), Dartmouth Medical School, Hanover, New Hampshire. Requests for reprints should be addressed to Patricia Carney, RN, MS, Department of Community Health Care Systems, University of Washington, Seattle, WA 98195.

system based primarily on the use of a customized flow sheet kept in patients' charts and assignment of responsibility by practice members directed at meeting practice goals for prevention.

Methods

Cancer Prevention in Community Practice Project

The purpose of this randomized controlled trial was to evaluate the impact of two interventions on physicians' cancer control behavior. The recruitment and methods of the study are described elsewhere,¹⁴ as are the characteristics and baseline activities of participating physicians.¹⁵ Briefly, 98 general internists and family practitioners in New Hampshire and Vermont volunteered and completed the study. Characteristics of physicians were not significantly different between those in the office system intervention group and those in the comparison group. Fifty practices received the office system, and 48 served as comparison practices. The mean ages were 42.2 years in the intervention group and 41.3 in the comparison group. Forty-six (92%) of those in the intervention group were men; there were 46 (98%) men in the comparison group. Seventeen (35%) of the physicians in the intervention group specialized in internal medicine and 33 (66%) in family medicine, whereas 16 (34%) of the physicians in the comparison group specialized in internal medicine and 32 (67%) in family medicine. Thirty-eight (76%) of the physicians in the intervention group and 44 (92%) in the comparison group were certified. One half (25) of the physicians in the group that received the intervention were in solo practice and the other half were in partnerships. Twenty-two (48%) of the physicians in the comparison group were in solo practice and 24 (52%) were in partnerships. The baseline performance of cancer control activities from this sample was similar to that reported previously.³

Cancer control target areas included: early detection of breast, cervical, and colorectal cancer and counseling for nutrition and smoking cessation. The National Cancer Institute's Working Guidelines¹ and others^{16,17} were followed for procedure-specific recommendations. The interventions were based on social cognitive theory,^{18,19} which postulates that there is a reciprocal relation between cognition and environment that influences behavior. The interventions were examined independently and in combination using a 2 × 2 factorial design. One intervention involved an interactive educational program (to influence cognition) and is described in detail elsewhere.²⁰ The office system intervention (to influence

practice environment), implemented in 50 practices, is described here. The study's main effects were evaluated using patient exit questionnaires and record review. Methods for evaluation and results of the study's main effects are presented in detail elsewhere.²¹ Briefly, main study results indicated that in practices in which the CPCP office system was implemented (as compared with those in which it was not), increases in all target services were seen. Mammography increased approximately 33%, from less than 60% of women served to almost 80%. Home stool occult blood testing, clinical breast examination, breast self-examination advice, and smoking cessation advice were 20% to 25% higher, which lasted during the study's 12-month evaluation period.²¹

The Cancer Prevention in Community Practice Study was based at the Dartmouth Primary Care Cooperative Information Project, a research network of primary care physicians in private practice who have been performing office-based research for the past 12 years.²² Experience in physicians' offices served as the foundation for the development of the office system intervention.

The Office System Intervention

An office system was defined as a series of routine activities that are consistently done for a specific purpose by multiple people within the practice. One example is an office billing system. Patients do not leave the physician's office without a bill being generated, and this process usually involves the receptionist, physician, and billing clerk.

Four core functional components of the CPCP system were developed to provide structure for study purposes, while flexibility in meeting practice needs was seen as vital in actual system implementation. The core components include:

- Identifying patients in need of services
- Monitoring patients' receipt of services over time
- Reinforcing positive patient behavior
- Providing feedback to practice members on how the system is working in order to reinforce its use.

A set of tools was developed to meet each of the functional components of the CPCP system. The tools served to incorporate the system's functional components into office practice. Therefore, the core components of the system were common across practices, but tool use was customized to meet the individual needs of practice settings. The available tools and the office system components they were designed to meet are outlined in Table 1. Incorporation of all tools was encouraged for establishment of the "ideal" office system. Practices were re-

Table 1. Office System Components, Tools, and Functions

Identify Patients in Need of Services

- *Customized patient intake form*, a questionnaire designed to determine patients' personal health habits, past medical history, and receipt of preventive services
- *External chart identifiers*, Day-Glo stickers to remind physician that patients are at high risk or may be in need of services

Monitor Receipt of Services Over Time

- *Flow sheets, crack-and-peel stickers, or rubber stamps*, different methods to track receipt of services or recommendations for services over time; customized to meet the needs of each individual practice
- *Preprinted prevention Post-it Note*, to prompt the provider to discuss or recommend the service

Reinforce Positive Patient Behavior

- *Prevention prescription pad*, a larger version of a medication prescription pad used to provide specific instructions to patients
- *Health Diary*,²³ a patient-held chart that lists preventive services in conjunction with a grid showing the intervals at which preventive actions should be performed according to the patients age; used to encourage patients to share in the responsibility for obtaining preventive procedures

Feedback Information to Practice Members

- *Chart audit*, a brief record review that evaluates tool use and procedures either performed or recommended to patients; initiated by CPCP project staff, but eventually taken over by practice staff

quired, however, to incorporate at least one tool to meet each function. The first 2000 flow sheets and all other selected tools were provided free to the practices by the CPCP for the study period.

An office system agreement was developed by each practice to identify both the tools chosen by individual practices and the preventive goals for patients needed to meet their system requirements. Identifying preventive goals involved delineating age and sex-specific variables and the percentage targeted to receive services, which were later used to score the office system audits. Participating physicians and their staff members signed the agreement, which served to reinforce their commitment both to cancer control and their office system.

Office System Implementation

THE OFFICE SYSTEM COORDINATOR

The method used in CPCP to facilitate implementation of the office system was based on the work of Fullard and colleagues,^{24,25} who used facilitators to set objectives and assist primary care practices in undergoing changes that improved their cardiovascular preventive activities. The facilitators were known to the practices in CPCP as office system coordinators. The office system coordinators had organizational and group process skills as well as a working knowledge of primary care practice. Seven coordinators were hired and trained to implement the office system. Training involved an orientation to the CPCP and office system components. The coordinators then developed and implemented systems in three pilot test sites before working with study practices.

The role of the coordinators was to present the CPCP office system concepts to practices, assist them by

facilitating group process in the development and implementation of their system, and provide consultation to identify and overcome difficulties with their system. Practices were assigned by geographic location, and each office system coordinator worked with between 5 and 12 practices. All CPCP communications were directed to a designated office contact from the staff of each practice. The steps leading to full office system implementation are outlined in Table 2.

PRACTICE ORIENTATION

Practice orientation was a 90-minute, highly interactive introductory meeting involving the physicians and all staff members having patient contact in the practices. At this meeting the intervention was briefly described and current office operations were analyzed using a patient-flow approach. The details of the CPCP office system components were explained and tools were introduced. The coordinator then facilitated a discussion among office staff and the physicians about what they wanted to change in their current office organization to meet the functional criteria of the CPCP office system. Decisions involved which tools to use in their practice and who would take responsibility for ensuring that the use of the tool was carried out. Practice personnel also decided on a flow sheet design, completed the office system agreement, and chose a start date for implementing outlined changes at the orientation session.

After orientation, the coordinator developed a customized manual for each practice that included: a patient flow diagram illustrating the activities that would now be incorporated into new and established patient visits, a responsibilities outline, which summarized all practice members' duties regarding the use of the tools they

Table 2. Steps to Office System Implementation

Project Activity	Week Performed*	Method	Practice Members Involved
Orientation	Before implementation	Visit	All having patient contact
First follow-up	3	Telephone	Designated office contact
Mini-audit	5	Visit	Designated office contact
Second follow-up	6	Mailed report	All with CPCP office system responsibilities
2-Month audit	12	Visit	Designated office contact and designated audit staff member
Third follow-up	13	Mailed report	All with CPCP office system responsibilities
7-Month audit	32	Visit	Designated audit staff member
Fourth follow-up	33	Mailed report	All with CPCP office system responsibilities
12-Month audit	52	Internal	Designated audit staff member

*Start date was considered the first day of week 1.

selected, and an office system tools sheet, which identified the selected tools and outlined how they met the functions of the office system components. The manual also contained a copy of the office system agreement for reference regarding the practices' preventive goals. It later served to orient new employees, especially in practices where staff turnover was frequent. The office system coordinator delivered the selected office system tools and customized office system manual approximately 3 days before the designated start date for the implementation.

FOLLOW-UP SUPPORT

Follow-up support consisted of practice visits and telephone follow-up performed at the discretion of the coordinator. All practices were telephoned within 2 days after their designated start-up dates to establish that practice changes were instituted on the predetermined day, and all practices received visits at the first two chart-audit feedback points.

Two weeks after the implementation date, an audit was performed by the coordinator. The purpose of the audit was solely to provide feedback to practice members on how the office system was meeting the practice's goals. It was not used as an evaluation method for study outcomes. The first audit was based on 7 to 10 charts of patients over age 20 years seen the day before the audit. Criteria for evaluation of the office system using the audit involved assessing the number of flow sheets in patients' charts that were in active use. The audit scores were derived by assessing the number of eligible patients who were either provided with or recommended to have the

cancer control activity. A formal audit report was sent to each practice and was followed up with a telephone call. Revisions in the practice activities were made in response to problems identified in the audit, and the manual was altered correspondingly.

More substantial audits were performed at 2 and 7 months after the implementation date. These audits were based on 30 charts of patients over age 40 years seen 1 or 2 days before the audit date. A designated office staff member took over the auditing procedure. This designated person was responsible for collecting the charts for audit by selecting names of patients over age 40 years from the appointment book in reverse chronological order until 30 had been selected. The 2- and 7-month audits were performed by the office staff member with the office system coordinator's assistance. At 12 months postimplementation, the auditing procedure was internalized and performed at intervals designated by the practice.

Approximately 12 months after implementation, meetings were held in key geographic locations in order to give practice members the opportunity to share their experiences with the office system intervention. Sixty percent of the practices were represented at one of these meetings. The sharing of ideas and experiences further reinforced system use.

EVALUATION

Specific instruments were developed to assess the process of office system implementation. At 2 and 7 month post-audit, questionnaires were completed by the coor-

Table 3. Percentages of Practices (n = 50) by Member with Primary Responsibility for Office System Functions at 7 Months

Office System Function	Practice Member			
	Physician	Clinical Staff	Shared Physician and Clinical Staff	Administrative Staff
<i>Identify</i> patients	30	39	17	13
<i>Monitor</i> services	63	9	28	0
<i>Reinforce</i> patient behavior	46	22	30	2
<i>Feedback</i> to practitioners	0	43	0	57

dinator after the performance of these feedback functions. These instruments assessed changes in tool use and office system responsibilities as well as office system adoption levels at the given times. Finally, questions evaluating other process components, such as commitment to prevention and quality of interoffice communication, were obtained from both physicians and office staff members of all participating practices at 1 year postimplementation of the intervention. These questionnaires were pilot tested in the practices where pilot testing of the office system took place.

An activity index was derived by adding the total number of patients seen per day and dividing by the total number of full-time practice members (summations were made of part-time positions to make full-time equivalents). This index was developed to attempt to identify predictors in personnel-patient configurations that were associated with success or failure of the office system.

Results

Practice characteristics varied widely. The number of patients seen per day at each practice ranged from 10 to 80, with a mean of 33.4. The number of full-time and part-time providers (including physicians, physician assistants, and nurse practitioners) ranged from 1 to 9, with a mean of 2.2. The number of clinical office staff (including registered nurses, licensed practical nurses, and medical technicians) ranged from 0 to 10, with a mean of 2.3, and the number of administrative staff (including receptionists, bookkeepers, and transcriptionists) ranged from 0 to 8, with a mean of 2.3. The activity index ranged from 2 to 10, with a mean of 5.0. No personnel-patient configurations were found to be associated with success or failure of the office system.

Full adoption of the CPCP office system was defined as use of flow sheets to address at least 8 or more of the 10 target areas in 75% or more of audited charts, use of all tools as outlined in their agreement, and attainment of 80% or more of practice goals. Full adoption of the office system at 2 months postimplementation was apparent in

74% of practices. Partial adoption was defined as use of flow sheets to address 6 or 7 target areas in 50% to 74% of charts, use of one tool to meet each of the functions as outlined in their agreement, and attainment of 50% to 79% of practice goals. Partial adoption was apparent in 26% of participating practices at 2 months postimplementation. At 7 months postimplementation, 81% of practices had fully adopted their CPCP systems, with partial adoption in the remaining 19%. The average overall cost of implementing the office system tools (not including coordinator and follow-up support) was approximately \$186 per practice.

IMPLEMENTATION OF THE OFFICE SYSTEM

All 50 practices implemented changes in their practices that met the core functional components for the CPCP office system. Ninety percent of participants implemented their office system within 8 days of the date they selected to begin. Study practices required approximately four visits (including orientation, audit, and other visits) to reach full implementation. This did not differ significantly in the group that received the CPCP educational intervention²⁰ before the CPCP office system intervention. However, the mean number of follow-up telephone calls was significantly less in the group that received the educational intervention (13.6 and 21 calls, respectively).

The practice members who were primarily responsible for each of the four office system functions are identified in Table 3. As illustrated here, physicians and clinical staff either independently or in collaboration took primary responsibility for identifying, monitoring, and reinforcing office system components, while the administrative staff took primary responsibility for the feedback component.

Responsibility for office system functioning was also examined. This involved ensuring that all practice members were informed about office system activities as well as coordinating all interpractice meetings relevant to the office system. The person with primary responsibility for overall office system functioning at implementation was the physician only 50% of the time. Forty-five percent of

Table 4. Practices (n = 50) Using Office System Tools at Baseline and 7 Months After Implementation

Office System Tool	Baseline, %	7 Months After Implementation, %
Flow sheets	21	100
Patient education materials	50	75
Prevention posters	7	59
Health maintenance diaries	0	43
Prevention prescription pads	0	41
Prevention Post-it Notes	0	34
External chart identifiers	7	32

the time, the physician shared primary responsibilities with the clinical staff. This remained essentially unchanged at both 2 and 7 months after the implementation date.

Tool use at baseline and 7 months after the implementation date is shown in Table 4. As illustrated here, some form of flow sheet was implemented in all practices.

Discussion

Primary care practices can institute major reorganization to overcome barriers to providing preventive services. As the Cancer Prevention in Community Practice Project has shown, flow sheets of customized format (as well as other tools) can be implemented and used over time to document and prompt performance of preventive procedures. In addition, expanded use of techniques to reinforce positive patient behavior such as distribution of health maintenance diaries and prevention prescription pads was well accepted by practices. We believe that taking control of decisions made in the division of responsibilities and tool use reinforced the practice's commitment to instituting change and increased both the teamwork and tenacity with which prevention was addressed in practice. In addition, we believe that taking on more tool use and thus responsibility for implementing that tool was not necessarily better. Rather, an exploration of where gaps occurred and addressing how to fill them with current practice members resulted in much improved efficiency in office operations. It is therefore not appropriate to make comparisons between higher and lower levels of CPCP office system effort, since what worked in one practice would not necessarily work in similar practices.

The negotiation of responsibilities among practice members regarding the system components can and must be successfully accomplished for change to occur. Our experiences taught us that collaborative methods using the CPCP office systems approach to address preventive procedures was acceptable and successful in assisting the

practices to accomplish their preventive goals. The teamwork that practice personnel illustrated was evident in the sharing of primary responsibilities. Teamwork was especially strong between providers and clinical staff in monitoring patients' preventive services status and reinforcing positive patient behavior. Monitoring preventive services status and patient education reinforcement are two activities that can be and are often performed by both nurses and physicians. These activities may have been ineffectively undertaken before the clear delineation of roles that occurred as part of this investigation.

Studies examining the role of clinical staff in primary care are limited. One survey of registered nurses working in primary care revealed an underutilization of nurses' training and skills.²⁶ Another survey administered in Minnesota revealed that nurses in community-based practice have strong professional interests, and a majority would welcome job changes that would allow more time and responsibility in patient care.²⁷ Professional associations and organizations that guide practice for physicians have long been established in primary care (American Academy of Family Practice, American College of Physicians). Similar organizations that would guide nursing practice are just developing in primary care (American Association of Office Nurses), and these should soon encourage office nurses to take a more active role in patient education and in monitoring performance of preventive activities. A collaborative approach toward prevention initiated by these professional organizations, as intermediaries, could potentially assist in the implementation of programs such as the one developed and tested in the CPCP study.

The use of computerized reminder systems has been examined by McPhee¹² and MacDonald,¹³ and their co-workers, in academic settings that include community practice faculty, and have been shown to increase the performance of preventive procedures substantially. The generalizability of these findings may be limited with respect to accomplishing the same result in community practice. McPhee and colleagues²⁸ recently completed a randomized controlled trial examining computer-generated prompts in a community practice setting. They achieved significant results in the group that received the computerized prompts compared with controls for nine target areas including stool for occult blood, rectal examinations, pelvic examinations, Papanicolaou smears, breast examinations, smoking assessment and counseling, and nutritional assessment and counseling.

The implementation of changes that are intended to affect a significant number of patients in primary care settings is a dynamic process that takes time to incorporate successfully. In addition, it is an important challenge that cannot be undertaken by physicians alone. Physi-

cians and staffs, both nursing and administrative, when given the appropriate tools in a collaborative environment, can work together to ensure that preventive procedures are offered to patients. Furthermore, the development of a strong teamwork approach can promote a tenacious commitment toward prevention. Questions that are now appropriate to ask include whether practices can institute the magnitude of changes made here without the support and intense follow-up that was provided by the office system coordinators. Such facilitators were deemed necessary in this study since the CPCP office system as an organizational intervention had not been proven. The inference that successful changes leading to important increases in preventive performance can be made in a wide variety of practice settings is compelling and may be motivation enough to persuade physicians to undertake such a program. The flexibility of the office system approach undertaken here is key to its acceptance in community practice.

Another question involves what format would be required to disseminate an office system approach such as the one developed here toward cancer prevention in primary care as well as prevention in other subspecialty areas. We feel that our approach is highly exportable using a packaged approach. Because the results of the study's main effects are compelling, we feel that implementation of a similar office system can be accomplished with less intensive strategies, such as using an intermediary organization to facilitate the process of office system introduction and follow-up. We also feel that the cost of office system tools (\$186 per practice) would not be prohibitive, and that use of an intermediary organization to facilitate implementation could also be cost-effective. The dissemination question will soon be answered. Dartmouth recently received funding to evaluate dissemination strategies for a combined office system and educational intervention, using the American Cancer Society as an intermediary organization.

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