
A Patient-Held Minirecord to Promote Adult Preventive Care

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Background. Compliance with guidelines for preventive service delivery to adults is inadequate. Patient-held minirecords have been successfully used to promote pediatric preventive care, and they hold promise for promoting adult preventive care as well. The objective of this project was to evaluate provider acceptance of a patient-held minirecord and the effect of this minirecord on compliance with a comprehensive set of adult preventive care guidelines.

Methods. The patient-held minirecord was distributed to all patients in two practice groups of a residency-affiliated family medicine clinic over a 4-month period. Patients in a comparison group practice in the same clinic did not receive the minirecord. Provider acceptance was evaluated by a survey completed by the intervention group providers at the end of the 4-month period. The effect of the minirecord on compliance with preventive care guidelines was evaluated by a chart review that compared baseline compliance rates for individual patients and individual preventive serv-

ices with compliance rates after 6 and 18 months.

Results. Responses on the provider survey indicated a high rate of acceptance by intervention group providers of using the patient-held minirecord. It was believed to improve knowledge about and performance of preventive services without requiring significant additional effort or time commitment. The chart review found that provider compliance (defined as either ordering or performing a preventive service) was significantly improved for intervention group patients after 6 and 18 months. The intervention was beneficial for the delivery of a broad range of preventive services.

Conclusions. Use of a patient-held minirecord for adult preventive care can be well accepted by providers and lead to improvements in compliance with guidelines for adult preventive care.

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Poor compliance with recommended schedules of clinical preventive services is a well-documented problem in primary care.¹⁻¹² The good intentions and usual resources of providers are often insufficient to carry out satisfactory clinical prevention. Most intervention programs have targeted providers, either through education^{7,13-15} or improved office systems.¹⁶⁻²³ These provider-oriented interventions have been only partially successful. One major reason for this may be that provider-oriented interventions fail to involve the person with the most to gain from the clinical prevention effort: the patient.

Patients are more than passive recipients of clinical preventive services. Several patient characteristics (such

as knowledge level,²⁴ interest in prevention,^{25,26} and fears of finding disease²⁷) influence the successful performance of preventive services. Interventions to positively affect patient factors have received little study, although their importance is being increasingly recognized.^{26,28,29}

Patient-held minirecords are a patient-oriented intervention that has been extensively used to promote preventive services for children³⁰⁻³³ and pregnant women.^{34,35} The familiar pediatric immunization card has been found to increase immunization rates across a broad range of pediatric population groups in the United States.³⁰ The American Academy of Pediatrics currently distributes two patient-held minirecords for pediatric health maintenance,^{31,32} and similar pediatric minirecords are used internationally.³³ Many pregnant women in Great Britain carry a "cooperation card" that summarizes the progress of their pregnancy,³⁴ and pregnant women in Utah receive a record booklet covering both prenatal care and well-child care for the first 2 years of life.³⁵

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<p>Health Checks Modern medicine strives to prevent disease <i>before</i> it can do harm. Research has shown for adults that some periodic tests and procedures can help do this. These important "health checks" are described below.</p> <p>Blood Pressure—If it is high, it can cause heart disease, strokes, and kidney problems. It should be checked yearly.</p> <p>Cholesterol—A substance in the blood which in excess can cause heart disease. It should be checked every five years.</p> <p>Tetanus-Diphtheria Vaccination—This builds immunity to tetanus and diphtheria infections. You should receive this vaccination every ten years.</p> <p>Influenza Vaccination—This builds immunity to influenza infections. You should receive this vaccination yearly after age 65.</p> <p>Pneumococcal Vaccination—This builds immunity to pneumococcal infections. You should receive this vaccination once, at age 65.</p> <p>Fecal Occult Blood Test—This detects small, invisible amounts of blood in the stool that can sometimes be an early sign of bowel cancer. This should be checked yearly after age 45.</p> <p>Pap Smear—This procedure detects early signs of cancer in a small amount of tissue scraped from the surface of the cervix. Women should receive this test every year for three years. If these results are normal they may then receive it less often at the discretion of their physician or nurse practitioner.</p> <p>Breast Exam—The breasts are examined for lumps and other abnormalities which can sometimes be early signs of cancer. Women should receive this exam from their physician or nurse practitioner every three years until age 40 and yearly thereafter.</p>	<p>Mammogram—An x-ray exam that may detect breast cancer even before a lump can be felt. Women should receive this exam yearly after age 50.</p> <p>Additional Health Checks—Since everyone's health needs are different, more frequent or additional "health checks" may be appropriate for you. Consult with your physician or nurse practitioner regarding additional tests you may need. Space is provided to record these in the Health Diary.</p> <p>Self Checks There are also some important "self checks" that you can perform:</p> <p>Women — examine your breasts every month for lumps. Men — examine your testicles every month for lumps, especially between the ages of 20 to 30.</p> <p>A Healthy Lifestyle The "health checks" in this diary, while important, will not in themselves assure health. Remember, it is also important for <i>you</i> to:</p> <ul style="list-style-type: none"> • Avoid smoking • Drink alcohol only in moderation • Get regular exercise • Wear automobile seat belts • Avoid prolonged exposure to the sun • Eat a balanced diet — low in fat, high in fiber <p>Members of the clinic health care team will be glad to advise you regarding a healthy lifestyle and performing self checks.</p> <p><small>The Health Diary Project, Department of Family and Community Medicine, University of California, San Francisco 94117 © L. Dickey, 1988</small></p>	<p>Health Diary</p> <p>Name _____</p> <p>Address _____</p> <p>Telephone _____</p> <p>In an emergency, contact _____</p> <p>FAMILY HEALTH CENTER 995 Potrero Avenue San Francisco, California 94110 821-8606 Weekdays 648-4323 Nights & Weekends</p> <p></p> <p>This Health Diary will help you keep track of tests and procedures that are important for your health. This Health Diary will also serve as a reminder to your physician or nurse practitioner, who will help you update it frequently. Please bring it to each clinic visit and take care of it as you would any valuable document.</p>
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Figure 1. Health Diary (outer aspect). Arrows indicate fold lines. Actual size folded is $5 \times 3\frac{1}{4}$. Reprinted from Dickey and Pettiti.³⁸

Patient-held minirecords for adult preventive services have not been widely used or studied, but this is a subject of increasing interest. The US Department of Health and Human Services is developing the "Passport to Health" as a key component of its "Put Prevention into Practice" initiative, and the Health Education Authority in Great Britain is developing the "Personal Health Record" as part of a national effort to improve delivery of preventive care.

In 1989, Dietrich and Duhamel³⁶ reported that a "patient-held checklist" mailed to geriatric patients resulted in improved performance rates for cancer screening but not blood pressure measurement or influenza immunization. In 1990, Belcher³⁷ reported a clinical trial at a Veterans Administration hospital in which a "pocket guide" was mailed to patients as part of a packet of educational materials. This intervention did not result in change in performance rates of four preventive services (blood pressure measurement, fecal occult blood testing, or provider inquiries about smoking and alcohol use).

In 1988, we developed a prototype patient-held minirecord, called the "Health Diary," at the University of California, San Francisco (UCSF). In a survey, family physicians in California indicated support for the potential use of such an instrument in practice.³⁸ The Health Diary was subsequently evaluated in clinical practice at the Family Health Center in San Francisco, which is a

large, inner-city clinic that serves as the primary teaching site for the university's family practice residency program. This paper reports the results of the evaluation. The two major questions addressed were: Would use of the Health Diary be acceptable to providers? and Would use of the Health Diary improve compliance with recommendations for preventive service delivery?

Methods

The Health Diary is a heavy paper card that is folded to the size of a passport ($3\frac{1}{2}'' \times 5''$). The outer aspect (Figure 1) of the Health Diary contains basic information on the nature and timing of preventive services. The inner aspect (Figure 2) is a chart displaying a basic schedule of preventive services, as well as providing space for recording dates and results of preventive services that have been performed. The schedule of preventive services represented on the Health Diary was derived from health maintenance flow sheets already in use in patient charts at the Family Health Center.

A quasi-experimental design was employed that involved the preexisting three practice groups of the clinic. The practice groups are located in different areas of the same building. Two of the practice groups are located on one floor and share support services and, occasionally,

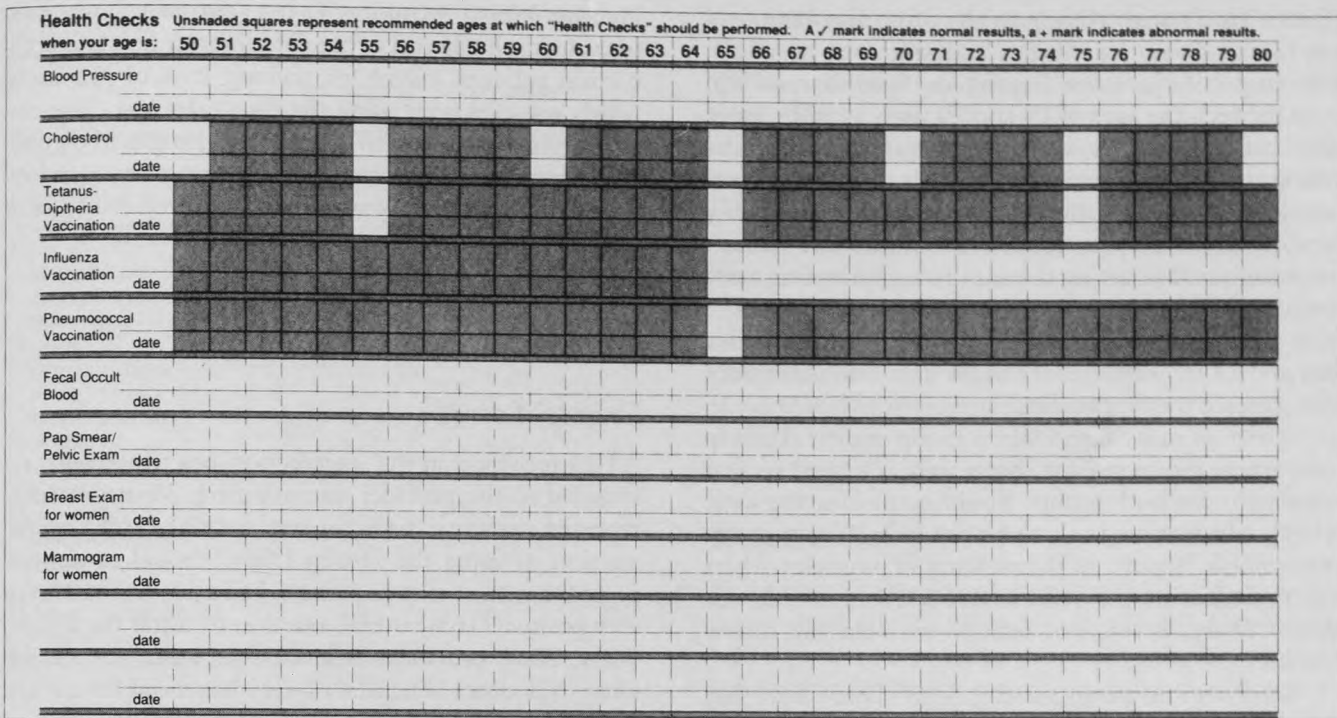


Figure 2. Health Diary (inner aspect). A separate chart (not shown) is used for ages 18 to 49 years.

nursing staff. The third practice group is located on another floor and has largely separate support services and nursing staff. Patients are assigned to these groups on a rotating basis according to order of registration, except for members of the same family, who are often assigned to the same provider. Assignments of providers to practice groups are made administratively in order to balance the numbers and training levels of providers between practice groups.

In the initial phase of the project, providers in all three practice groups received copies of the Health Diary and information about the project through a written announcement and an oral presentation. Immediately following this, during a 4-month period from December 13, 1988, to April 13, 1989, all English- and Spanish-speaking patients coming to the two more closely related practice groups were given a copy of the Health Diary in the appropriate language, while the patients of the more isolated practice group did not receive the Health Diary or any other special intervention.

Distribution of the Health Diary during this 4-month intervention period was coordinated by the nursing staff, who gave an informational sheet on the project to patients and clipped a copy of the Health Diary to the patient visit record. The provider gave the Health Diary to the patient, explained its use, and filled out the record portion (with patient participation, if possible). For tracking purposes, the nurse placed a sticker on the

patient visit record denoting that the Health Diary had been given. For return visits to the clinic, the nursing staff began each encounter by asking patients if they had received a Health Diary. If they had not, they were given one. If they had left it at home, they were encouraged to bring it to subsequent visits. Posters were also placed in the patient waiting rooms explaining the importance of the Health Diary and encouraging patients to bring it to each clinic visit.

Approximately 1000 copies of the Health Diary were distributed to the intervention group patients during the 4-month period of the intervention. Subsequently, copies of the Health Diary continued to be available for optional distribution by providers through display racks in examination rooms in the intervention practice groups only. No attempt was made to track the informal distribution of copies of the Health Diary after the intervention period.

Evaluation of provider acceptance of the Health Diary was obtained by a questionnaire given to all intervention practice group providers at the end of the 4-month period of Health Diary distribution. The effect of the Health Diary on the ordering and performance of preventive services was evaluated by a chart review carried out by a research assistant and the principal investigator (L.L.D.). The charts reviewed were those of the first 200 intervention group patients and the first 100 comparison group patients who had come for a visit

("index visit") with their provider after distribution of the Health Diary had begun and who met all of the following criteria: were English or Spanish speaking; were between the ages of 19 and 79 years as of the index visit; had at least one visit with a continuity provider during the 14 months before the index visit; had at least two visits (including the index visit) with a continuity provider in the 18 months after the index visit; had not been diagnosed as having the acquired immunodeficiency syndrome (AIDS) or AIDS-related complex (ARC); were not pregnant between 14 months before the index date and 18 months after the index date; had never been seen for care by the principal investigator (L.L.D.).

Twice as many intervention group patient charts as comparison group patient charts were reviewed so that index visits for both groups would occur over the same period, which turned out to be the first 30 days of the intervention. Because of the presence of multiple stickers and notations in the patient charts about use of the Health Diary, it was not feasible to blind the review process.

Intervention group patients who should have but did not receive a Health Diary were, nonetheless, included in the chart review. These "intent to treat" patients constituted 9% of the intervention group patients whose charts were reviewed. It was not possible to determine from records why these patients did not receive a copy of the Health Diary.

Information on the delivery of all clinical preventive services listed in the Health Diary except blood pressure measurement, which was performed routinely at every visit, was collected by chart review. Baseline data on clinical preventive service delivery were collected as of the index visit, with follow-up data collected 6 and 18 months after the index visit.

Individual clinical preventive services were classified as "indicated" or "not indicated" based on the patient's age, sex, and medical history. Influenza, tetanus-diphtheria, and pneumococcal vaccinations were classified as "not indicated" if the patient's chart documented a history of an adverse reaction as the reason for not receiving these vaccinations. Mammography was classified as "not indicated" if the patient's chart documented a history of bilateral mastectomies. Papanicolaou smear was classified as "not indicated" if the patient had a history of a hysterectomy or (at any time) three consecutive normal annual Papanicolaou smears.

Compliance was calculated as the percentage of "indicated" preventive services performed or ordered within the interval (with an additional 2-month grace period) specified in the Health Diary.

Statistical analysis of the chart review results was performed using Crunch Interactive Statistical Package

(version 3.05A).³⁹ Student's *t* test (two-tailed) was used to evaluate all differences between intervention and comparison patients, except for training level of providers, which was evaluated using the chi-square test. The chi-square test was also used to evaluate changes in compliance from baseline for individual preventive services. Statistical significance was defined by a probability value of $\leq .05$.

Results

Provider Survey

All 25 providers in the intervention practice groups responded to the provider questionnaire. Most providers reported a positive (64%) or very positive (16%) overall reaction to using the Health Diary. Providers also reported that most of their patients had a positive (60%) or very positive (16%) overall reaction to using the Health Diary. Most providers believed that using the Health Diary was either beneficial or very beneficial for patient knowledge (82%), provider knowledge (60%), performance of preventive services (66%), and recording of preventive services in patient charts (54%). Eighty-three percent of providers believed that use of the Health Diary had not affected patient flow in the practices, while a small percentage (17%) believed that its use had a negative effect on patient flow.

Almost all (96%) of the providers believed that the time and effort required for using the Health Diary was manageable in their practices. Twenty-three percent of providers qualified the term *manageable* as "easily" while another 14% qualified *manageable* as "only with difficulty." Only one provider believed that use of the Health Diary was not manageable in terms of the time and effort required.

Providers reported filling out the Health Diary for the majority of their patients (mean = 64%, SD = 29%). Patients were reported to have brought the Health Diary with them to somewhat less than half (mean = 40%, SD = 23%) of their return clinic visits.

Chart Review

The demographic and medical characteristics of patients in the intervention and comparison groups were not significantly different (Table 1). More patients in the comparison group were seen by nurse practitioners (7%, compared with 0%) or less experienced residents (first-year residents, 18%, compared with 12%; second-year residents, 22%, compared with 18%) than patients in the intervention group, who were more often seen by third-

Table 1. Characteristics of Comparison and Intervention Patients Whose Charts Were Reviewed

Patient Characteristic	Intervention Patients (n = 200)	Comparison Patients (n = 100)	P Value
Mean age (years)	54.0	55.8	.26
Male sex (%)	29	27	.67
Spanish-speaking (%)	49.3	54.5	.39
Mean no. of hospitalizations during 14 months before index date	.24	.22	.72
Mean no. of hospitalizations during 18 months after index date	.18	.32	.12
Mean no. of medications on index date	3.17	2.94	.38
Mean no. of continuity visits during 14 months before index date	6.1	5.9	.72
Mean no. of continuity visits during 18 months after index date	6.9	6.2	.11

year residents (25%, compared with 18%) and attending physicians (24%, compared with 17%).

The mean compliance at baseline was not significantly different for intervention and comparison patients (62.5% and 64.7%, respectively [$P = .48$]). After 6 months, the mean compliance of intervention patients had improved by 13.3%, while that of comparison patients had improved only by 1.7% ($P < .0001$). After 18 months, the mean compliance of intervention patients had improved by 5.4% over baseline, while that of comparison patients had fallen to 3.9% below baseline ($P = .006$).

Controlling for provider training level with analysis of covariance did not significantly affect the differences in changes in mean compliance between intervention and

comparison group patients after either 6 or 18 months. Similarly, controlling for patient demographic and medical characteristics using regression analysis did not affect these results.

Calculation of compliance for individual preventive services revealed that the intervention had a broad effect (Table 2). Baseline compliance was not significantly different between patients in the intervention and comparison groups for any preventive service. Compliance was significantly improved after 6 and 18 months for six of eight preventive services for intervention patients, while compliance was not significantly improved for any preventive service at either follow-up point for comparison patients.

Discussion

The results of the provider survey indicate that use of a patient-held minirecord such as the Health Diary can be well accepted by providers. Not only did the providers believe that its use improved preventive care, but that it did so without substantially affecting time management or patient flow in the practice. This is of considerable practical significance, since interventions requiring more than minimal time expenditure or a decrease in the number of patients that a provider is able to see probably have little chance of being used in a busy clinical setting.

The results of the chart review indicate that use of a minirecord such as the Health Diary can lead to significant improvement in compliance with recommendations for delivery of preventive services. The mechanism for this effect cannot be well defined by this study because of the multifaceted nature of the intervention, which involved providers, patients, and nursing staff. The effect on providers was fairly well evaluated by the provider survey. The effect on patients was indirectly evaluated by the provider survey; however, the validity of provider

Table 2. Compliance (%) at Baseline and at 6 and 18 Month Follow-up for Individual Preventive Services

Preventive Service	Compliance (%) at Baseline		Compliance (%) at 6-Month Follow-up		Compliance (%) at 18-Month Follow-up	
	Intervention Patients	Comparison Patients	Intervention Patients	Comparison Patients	Intervention Patients	Comparison Patients
Fecal occult blood test	48.3	46.1	65.4 (+17.1)*	44.9 (-1.2)	32.4 (-15.9)	37.6 (-8.5)
Influenza vaccination	46.2	53.9	72.5 (+26.3)*	66.4 (+12.5)	56.0 (+10.0)	70.6 (+16.7)
Tetanus-diphtheria vaccination	45.5	54.0	54.5 (+9.0)	59.0 (+5.0)	58.0 (+12.5)*	59.0 (+5.0)
Pneumococcal vaccination	47.4	50.0	56.4 (+9.0)	60.0 (+10.0)	67.9 (+20.5)	54.8 (+4.8)
Breast examination	44.7	62.5	62.0 (+18.2)†	55.6 (-6.9)	48.2 (+3.5)	47.3 (-15.2)
Papanicolaou smear	63.0	60.4	78.0 (+15.0)*	53.6 (-6.8)	59.6 (-3.4)	49.1 (-11.3)
Mammogram	40.9	37.3	57.0 (+16.1)†	46.0 (+8.7)	61.8 (+20.9)†	40.9 (+3.6)
Cholesterol test	91.0	91.0	94.5 (+3.5)	95.0 (+4.0)	96.0 (+5.0)	96.0 (+5.0)

*Denotes that compliance is statistically different from baseline at $P < .05$.

†Denotes that compliance is statistically different from baseline at $P < .005$.

NOTE: Numbers in parentheses represent changes (%) in compliance from baseline at 6-month and 18-month follow-up.

reports about patient responses is difficult to assess. It is notable that the results of this study were much more positive than those of other studies in which minirecords were mailed to patients.^{36,37} It is likely that patients need the encouragement and guidance of providers and nursing staff to use this new tool and to adopt a more proactive stance toward preventive care.

The important role that the nursing staff can play in preventive care should be emphasized. Several studies have found that the nursing staff is very effective at performing, tracking, and prompting preventive care.^{21,40,41} In this study the effectiveness of the intervention decreased after 6 months. It is likely that the lack of ongoing involvement of the nursing staff in prompting providers and patients to use the Health Diary contributed to this decline.

The barriers to clinical preventive care are great, probably greater than providers, patients, and nursing staff working separately can overcome. The most important role for an intervention such as the Health Diary may not be as a patient-held minirecord per se, but as a tool to build cooperation between patients, providers, and nursing staff in the preventive care effort.

The statistical power of this evaluation to detect differential effects of the intervention on individual preventive services was limited. Also, a "ceiling" effect undoubtedly limited improvement in compliance for some preventive services, such as cholesterol testing, that were delivered at a high rate at baseline. That significant effects were detected for a broad range of preventive services indicates that the intervention helped overcome generic barriers to preventive service delivery.

Patient-held minirecords are a low-cost, potentially useful intervention to promote preventive care that deserve further evaluation in other settings. Such simple interventions have not traditionally attracted as much attention as more technologically sophisticated alternatives. We are hopeful that the emerging interest of the national health departments of the United States and Great Britain in patient-held minirecords for adult preventive care will lead to more extensive research on this important subject.

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