Can It Be Done? Implementing Adolescent Clinical Preventive Services

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Objective. To evaluate the implementation of an intervention to increase the delivery of adolescent preventive services within a large managed care organization. Target health areas were tobacco, alcohol, sexual behavior, and safety (seat belt and helmet use).

Data Source/Study Design. Adolescent reports of clinician screening and counseling were obtained from adolescents who attended well visits with their primary care providers. A pre-post study design was used to evaluate the preventive services intervention. The intervention had three components: (1) 89 clinicians from three outpatient pediatric clinics attended a training to increase the delivery of preventive services; (2) customized adolescent screening and provider charting forms were integrated into the clinics; and (3) the resources of a health educator were provided to the clinics.

Data Collection. Following a visit, adolescents completed surveys reporting on clinician screening and counseling for each of the target risk areas. Preimplementation (three months), 104 adolescents completed surveys. Postimplementation of the training, tools, and health educator intervention, 211 adolescents completed surveys (five months). For 18 months postimplementation clinicians delivered services and 998 adolescents completed surveys.

Principal Findings. Chi-square analyses of changes in screening from preimplementation to postimplementation showed that screening increased in all areas ($p < .000$), with an average increase in screening rates from 47 percent to 94 percent. Postimplementation counseling in all areas also increased significantly, with an average increase in counseling rates from 39 percent to 91 percent. There were slight decreases in screening from postimplementation to follow-up.

Conclusions. This study offers support for the efficacy of providing training, tools, and resources as a method for increasing preventive screening and counseling of adolescents across multiple risky health behaviors during a routine office visit.

Key Words. Adolescents, managed care, preventive services, quality improvement, risk behavior

INTRODUCTION

The majority of adolescent morbidity and mortality can be attributed to preventable risk factors (Ozer, Brindis, Millstein, et al. 1998). These include unhealthy behaviors such as substance use and abuse, unsafe sexual practices, and risky vehicle use. Risky behaviors tend to co-occur (Irwin et al. 1997; Lindberg et al. 2000), and the prevalence of multiple risk behaviors increases with age (Brener and Collins 1998). Primary care providers are in a unique position to screen for risky behaviors and provide anticipatory guidance and brief counseling.

Most adolescents (73 percent) visit a physician once a year (Newacheck, Brindis, Cart, et al. 1999), with the majority of these adolescents receiving health services through managed care (Srinivasan, Levitt, and Lundy 1998). Several factors have led to increased attention on the preventive role of the health care system: Adolescents and young adults are one of four targeted groups within the Healthy People 2010 Initiative; quality measures are increasingly monitoring the care provided to adolescents (e.g., National Committee for Quality Assurance 1997); and data indicate that preventive interventions could have significant effects on adolescent health and health care costs (Downs and Klein 1995; Gans et al. 1995; Park, Macdonald, Ozer, et al. 2001; Rosen et al. 1997).

To facilitate the provision of preventive services to adolescents, guidelines specifically targeting the delivery of adolescent clinical preventive services have been developed by several national consensus groups.[1] In general these guidelines recommend that all adolescents have an annual confidential preventive services visit during which primary care providers screen, educate, and counsel them

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on a range of issues that affect adolescent health (for overview see Park, Macdonald, Ozer, et al. 2001).

Despite the dissemination of guidelines, delivery of preventive services to adolescents is below recommended levels. This is the case in private practice and community-based settings (Franzgrote et al. 1997; Igra and Millstein 1993) as well as in managed care organizations (Halpern-Felsher, Ozer, Millstein, et al. 2000). Barriers to guideline implementation include physician knowledge, physician attitudes, and external factors (Cabana, Rand, Powe, et al. 1999). Overcoming these barriers to improve professional practice is best achieved through interventions that combine two or more modalities such as educational outreach, interactive educational/clinical workshops, customized tools, feedback and reminders, involving local opinion leaders, and reaching local consensus (Bero, Grilli, Grimshaw, et al. 1998; Greco and Eisenberg 1993; Grimshaw and Russell 1993; Lomas and Haynes 1988; Oxman et al. 1995; Simpson, Kamerow, and Fraser 1998). Using a case manager has also been a successful component of some implementation programs (e.g., Carlson 1988).

The limited research that specifically focuses on adolescent preventive guidelines indicates that delivery of preventive services may be increased through training (Lustig, Ozer, Adams, et al. 2001; Sanci, Coffey, Veit, et al. 2000) as well as patient questionnaires, resource materials, and clinician manuals (Klein, Allan, Elster, et al. 2001). However, screening and counseling rates across multiple risk areas have remained below recommended levels, indicating that additional components are needed.

The Precede/Proceed Model (Green, Eriksen, and Schor 1988; Lawrence 1990) provides a framework that organizes the many factors likely to contribute to the delivery of adolescent clinical preventive services. Predisposing factors relate to the necessary attitudes and motivation to perform a behavior; enabling factors include the competence, skills, and resources necessary to perform the behavior; and reinforcing factors are those that support or reward the behavior (reviewed in Walsh and McPhee 1992). Training clinicians in the delivery of preventive services for adolescents, developing customized screening and charting tools, and providing the additional resources of a health educator may address the predisposing, enabling, and reinforcing factors that influence the delivery of adolescent preventive services.

The present study evaluates the implementation of an adolescent clinical preventive services intervention in outpatient pediatric clinics within a staff-model HMO. The goal of the intervention was to increase clinicians' screening and brief counseling of adolescents in the targeted health risk areas of tobacco, alcohol, sexual behavior, and safety (seatbelt and helmet use). We hypothesized that (1) clinician screening and counseling with adolescents during routine well visits would increase following a clinic-wide intervention involving provider training, customized screening and charting tools, and the resources of a health educator; and (2) the significant increases in clinician screening and counseling would remain over an 18-month follow-up period.

METHODS

The study was conducted in three outpatient pediatrics clinics within a large managed care system throughout Northern California. Independent adolescent reports of clinician screening and counseling practices were obtained from three separate groups of adolescents (mean age of 14 years) who attended well visits with their primary care providers: (1) one group prior to the preventive services intervention (preimplementation); (2) the second group after the intervention had been initiated in the clinics (postimplementation); and (3) the third group during an ongoing follow-up phase (follow-up). The effect of implementing the preventive services intervention was tested by examining changes in screening and counseling practices from the preimplementation to the postimplementation period. The sustainability of the intervention over a longer period was evaluated by examining screening and counseling rates obtained during the follow-up period. Implementation of the intervention was part of a larger study that addresses outcomes for adolescents who receive the preventive services intervention. All procedures were approved by the internal review boards at the University of California, San Francisco and the participating HMO.

Clinician Participants

Clinics were selected based on their provision of care to large numbers of adolescents and their agreement to participate in a longitudinal study of provision of clinical preventive services to adolescents. Each pediatric site had a physician "champion" who helped promote the study in their site and served as the major contact with the study investigators. In addition to the champion, several other

clinicians participated in a working committee that collaborated on the development of clinical forms and helped guide implementation of the intervention. All of the 89 clinicians in the three sites agreed to participate in the study and were trained in the intervention. Eighty-six percent were physicians and 14 percent were nurse practitioners; 58 percent were female. Median year of graduation was 1979.

The Preventive Services Intervention

The clinical preventive services intervention focused on the targeted risk areas of tobacco, alcohol, sexual behavior, and safety (helmet and seat belt use). All clinicians received training in adolescent preventive services, and clinicians used screening and charting forms customized for this study (see below for description). Clinicians were also provided referral lists for adolescent services within the managed care organization and the community (e.g., high schools). Study adolescents met with their primary care providers for a well visit that lasted 20 to 30 minutes. The overall intervention focused on adolescents taking responsibility for their health and learning ways to keep themselves healthy.

Following the primary care provider visit, study participants also met with a health educator hired for this study. The health educator reinforced primary care providers' messages and helped with prioritizing risk areas and setting behavior change goals if warranted. Although the health educator visit was a component of our larger study that addresses health outcomes for adolescents who receive the preventive services intervention, adolescent reports of clinician screening and counseling were completed immediately after seeing their primary care providers and prior to seeing the health educator. Thus, the present analyses focus on the delivery of preventive services by primary care providers, not by the health educator.

Training

The training workshops were developed using social cognitive theory (Bandura 1986, 1997) and were designed to enhance clinicians' knowledge, attitudes, self-efficacy, and skills to conduct preventive services. The eight-hour workshops focused on adolescent health, confidentiality, screening, and conducting a brief office-based intervention that included anticipatory guidance/brief counseling for the five risk behaviors. The office-based intervention was linked to the use of customized screening and charting tools. As suggested by the review of effective interventions for health professionals (Oxman et al. 1995), the workshops con-

tained four components: didactic, discussion, demonstration role plays, and interactive role plays. (For a detailed description of the training see Lustig, Ozer, Adams, et al. 2001).

Customized Tools

We collaborated with clinicians and staff in the clinic intervention sites to develop a self-report adolescent health screening questionnaire in conjunction with a provider charting form. These tools were used to assist the clinician with delivering preventive services during a well visit.

Adolescents completed a written questionnaire—the Adolescent Screening Questionnaire—prior to their physical exam visit. The questions ask about engagement in the five target risk areas. Health information from the screening questionnaire was then transcribed onto the provider charting form by a study research associate, providing the clinician with an assessment of risk and level of engagement in each risk area when the patient was seen during the well visit.

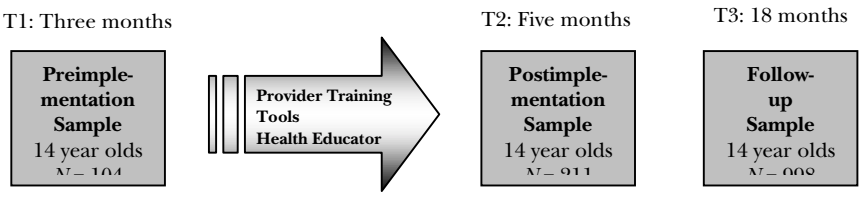
The Provider Charting Form included adolescent behavior information from the questionnaire along with cues for intervention messages that corresponded to the adolescents' engagement in risky health behavior. During the well visit clinicians first confirmed the risk behavior information with the adolescent to initiate a discussion. (There was a place on the form where clinicians indicated that they had asked the adolescent about the behavior.) If an adolescent was not engaging in a particular risky behavior, clinicians were cued to deliver a positive reinforcement message. If an adolescent was engaging in the risk behavior, clinicians expressed their reason for concern about the behavior and delivered a brief health-related message specific to that behavior. Clinicians documented on the charting form the delivery of services in each risk area. This charting form became a part of the adolescent's medical record. (The charting form is available from the authors.)

Evaluation of the Preventive Services Intervention

Participants were recruited using lists obtained from the clinics of adolescents with scheduled physical exam or sports physical visits. Adolescents were recruited over the telephone in advance of their scheduled visits. Formal consent from the parent and assent from the adolescent were obtained at the time of the visit. Across the three phases of the study, 67 percent of those contacted agreed to participate.

Reports were obtained from three samples of adolescents regarding their clinician's behavior during a well visit (see Figure 1). Data collection for the preimplementation baseline phase (T1) lasted an average of three months and included 104 14-year-old adolescents. These adolescents completed reports prior to

Figure 1: Evaluation Phases for Clinical Preventive Services Intervention



the implementation of the preventive services intervention. Data collection for the postimplementation phase (T2) began after the preventive services intervention had been initiated and lasted an average of five months. This sample consisted of 211 14-year-old adolescents. Data collection for the follow-up phase (T3) began following the postimplementation period and continued for 18 months (n = 998). During this period clinicians continued to deliver adolescent preventive services. The follow-up phase was comprised of adolescents who also agreed to participate in the broader study that focused on the behavioral and health effects of receiving preventive services. (The mean age of adolescents in the follow-up phase was 14.5 years, with ages ranging from 13.5 to 15.0 years.) As shown in Table 1, the three adolescent samples were ethnically diverse.

Table 1: Demographic Characteristics (%) of Three Adolescent Samples

Characteristic	T1	T2	T3
N	104	211	998
Gender			
Female	48	45	53
Male	52	55	47
Ethnicity			
Caucasian	47	50	48
Hispanic	22	18	19

African American	13	10	10
Asian, Pacific Islander	10	13	12
Native American	1	4	5
Other	7	5	6

Measure of Clinician Practices

Adolescents completed the Adolescent Report of the Visit questionnaire immediately following their routine, prescheduled physical exam visit. Adolescent-based assessments of provider behavior yield an appraisal of clinician practices that is free of the confounding influences of provider self-report and social desirability biases, and they have been shown to be a valid indicator of delivery of services (Klein, Allan, Elster, et al. 2001).

The Adolescent Report of the Visit, a 39-item patient-report measure, included questions on whether clinicians screened and offered brief counseling messages for each of the five target risk areas and possesses adequate construct validity (Lustig, Ozer, Adams, et al. 2001). An example of a screening question is: "Did your doctor ask if you smoke or chew tobacco?" Items tapping counseling differed depending on whether an adolescent was engaging in a particular risk behavior and whether he or she had let the clinician know about engagement in the risk behavior. An example of a counseling question for adolescents who were not engaging is: "Did your doctor encourage you to remain a non-smoker or non-tobacco user?" Similar screening and counseling questions were asked for each of the five risk areas. The response categories were dichotomous (yes or no).

Analysis Plan

The evaluation of the implementation included analyzing differences in screening and counseling rates at three different periods. Specifically, we used chi-square analyses to examine the changes from T1 to T2, from T1 to T3, and from T2 to T3. Analyses of changes from T1 to T2 and from T1 to T3 demonstrate the degree of change following the implementation and the maintenance of the changes for the 18-month longitudinal period. Analysis of change from T2 to T3 indicates change in screening and counseling in the 18-month follow-up period. We first present analyses of changes in screening levels in the five areas: tobacco

use, alcohol use, sexual behavior, and seatbelt and helmet use. We then present analyses of changes in counseling levels in the same health risk areas.

RESULTS

Screening

Chi-square analyses indicated that, based on adolescent reports, clinician screening practices increased significantly from T1 to T2. Adolescents reported being screened a greater percentage of the time at T2 than at T1 in each of the five risk areas: tobacco use (61 percent to 95 percent; $p < .000$), alcohol use (59 percent to 96 percent; $p < .000$), sexual behavior (47 percent to 82 percent; $p < .000$), seatbelt use (36 percent to 98 percent; $p < .000$), and helmet use (33 percent to 98 percent; $p < .000$). The aggregate screening score across all five risk areas also increased significantly (47 percent to 94 percent; $p < .000$). The increases from T1 to T3 were of a similar size and significance level (see Table 2). Although screening rate increases remained highly significant through the follow-up phase, there were small but significant decreases in rates between T2 and T3. Decreases in screening rates for the areas of tobacco, alcohol, seatbelt, and helmet use ranged from 4 percent to 7 percent from the postimplementation to the maintenance phase.

Brief Counseling

Clinicians' brief counseling increased significantly from T1 to T2 in each of the five risk areas: tobacco use (55 percent to 96 percent; $p < .000$), alcohol use (46 percent to 91 percent; $p < .000$), sexual behavior (41 percent to 76 percent; $p < .000$), seatbelt use (32 percent to 99 percent; $p < .000$), and helmet use (28 percent to 92 percent; $p < .000$) (see Table 3). The aggregate counseling score across all five risk areas also increased significantly (39 percent to 89 percent; $p < .000$). The increases from T1 to T3 were of a similar size and significance (see Table 3). Counseling rates in the areas of tobacco use, alcohol use, sexual behavior, and helmet use did not change significantly between T2 and T3. Only rates of coun-

seling about seatbelt use decreased significantly (5 percent) between T2 and T3, indicating that for the most part increases in counseling did not decline across the follow-up period.

Table 2: Screening Rates (%) and Chi-square Analyses Comparing Three Time Periods[†]

	Preimplementation		Postimplementation		Follow-up		Chi Square		
Variable	T1	n	T2	n	T3	n	T1–T2	T1–T3	T2–T3
Tobacco use	61	104	95	209	90	996	61.1***	75.6***	5.2*
Alcohol use	59	104	96	192	90	998	68.3***	77.0***	8.9**
Sexual behavior	47	104	82	181	84	998	38.6***	82.9***	0.4
Seatbelt use	36	104	98	210	94	995	151.5***	304.7***	5.1*
Helmet use	33	104	98	210	93	995	161.3***	304.8***	6.6**

*$p < .05$; **$p < .01$; ***$p < .001$.

[†]Sample size varies because of missing data for the dependent variables for some observations.

Table 3: Counseling Rates (%) and Chi-square Analyses Comparing Three Time Periods[†]

	Preimplementation		Postimplementation		Follow-up		Chi Square		
Variable	T1	n	T2	n	T3	n	T1–T2	T1–T3	T2–T3
Tobacco use	55	88	96	188	94	891	70.8***	134.8***	1.4
Alcohol use	46	92	91	180	88	866	66.1***	112.9***	0.8
Sexual behavior	41	91	76	193	78	913	33.0***	61.9***	0.6
Seatbelt use	32	103	99	209	94	991	174.5***	344.9***	8.9**
Helmet use	28	103	92	210	91	992	139.1***	284.0***	0.6

**$p < .01$; ***$p < .001$.

[†]Sample size varies in tobacco use, alcohol use, and sexual behavior based on the adolescents' engagement in these behaviors. Sample size may also vary because of missing data in all behavior areas.

DISCUSSION

This study evaluated an intervention to increase clinicians' delivery of preventive services to their adolescent patients in a group-model HMO. The findings support the hypothesis that clinicians' screening and counseling with their adolescent patients increase significantly following an intervention involving training, screening and charting tools, and the available resources of a health educator. The intervention resulted in dramatic increases in both screening and counseling from preimplementation to postimplementation. Significant increases were maintained from the preimplementation period through an 18-month follow-up period, suggesting that the delivery of adolescent preventive services was incorporated into the provision of routine care.

Our findings indicate that clinicians increased their screening and counseling of adolescents across all risky behaviors. However, the most marked improvement in screening and counseling was in the areas of seatbelt and helmet use. This is in contrast to previous research suggesting that it is difficult to alter clinicians' practices in the area of injury prevention (Hansen, Wong, and Young 1996). The preimplementation base rates for screening and counseling in the areas of seatbelt and helmet use were substantially lower than rates in the other areas, allowing more room for improvement. Additionally, the issues involved in seatbelt and helmet use are relatively straightforward and do not require extensive assessment or clinical sensitivity. In contrast, although preimplementation rates for screening and counseling in the area of sexual behavior were higher than for seatbelt and helmet use, rates did not increase to as high a level postimplementation. More targeted training may be required for addressing sensitive topics such as sexual behavior, especially when the focus is on preventive screening and counseling with younger adolescents such as the 14-year-old participants in this study.

Although screening rate increases remained significant through the follow-up phase, there were small but significant decreases in rates between postimplementation and follow-up. The follow-up phase was comprised of many more adolescents than were in the postimplementation period. While it is possible that clinicians decreased their screening over the course of 18 months, it is probable that the differences may be based more on sample size differences than on changes in clinical practice.

This study is the first to focus on the implementation of a brief office-based intervention to increase adolescent preventive services within a managed care

setting. Our prior work has shown that screening and counseling rates can be increased through skills-based training workshops for primary care providers (Lustig, Ozer, Adams, et al. 2001). However, the integration of screening and charting tools, along with the available resources of a health educator to provide further education and counseling, resulted in much greater improvements in the rates of delivery of adolescent services by primary care providers.

Interventions that combine two or more modalities are more likely to improve clinical practice (e.g., Bero, Grilli, Grimshaw, et al. 1998; Simpson, Kamerow, and Fraser 1998). In addition to developing skills through participating in an educational workshop, clinicians used customized tools. The charting form contained prompts and cues for screening and delivering counseling messages that were linked to each particular risk area, providing ongoing reminders. The charting form was developed collaboratively with the clinicians in the three sites. It was designed to be incorporated into the broader preventive care system within the HMO and became part of an adolescent's medical record. In addition to collaborative work on the development of the screening and charting tools, each pediatric site had a working committee and a physician champion. The consensus that was developed through collaboration with the chief in each department, the clinicians, and the administrators likely contributed to the incorporation of the intervention into the clinics and the high rates of clinician screening and counseling.

In another study that focused on the implementation of Guidelines for Adolescent Preventive Services (GAPS) in community health centers Klein, Allan, Elster, et al. (2001) also combined several intervention modalities as center staff were trained to implement GAPS and used resource materials, patient questionnaires, and clinician manuals. Although this intervention resulted in adolescents receiving more screening and counseling, postimplementation screening rates ranged from 21 percent to 48 percent. The higher rates of clinician screening and counseling postimplementation in the present study may be due to a more targeted intervention (five areas) and to our conducting the intervention in a group HMO where the training and screening and charting tools could be incorporated more uniformly into clinicians' practices. In other health care environments modifications may be necessary in the logistics of incorporating adolescent preventive services into routine care.

An additional factor that may have facilitated clinician screening and counseling was the availability of a health educator who could provide additional education and counseling. Adolescents reported high rates of screening and counseling by their primary care providers before seeing the health educator.

However, knowledge of the availability of a health educator may have made clinicians more likely to initiate screening and counseling, as the health educator may help facilitate external barriers to guideline implementation (Cabana, Rand, Powe, et al. 1999) such as where to refer patients or how to address a problem with only a limited amount of time. Because of the sequencing of implementing the intervention—the screening and charting tools and health educator component were initiated at the same time—we are unable to show the effect of the separate components of the intervention. Future studies are needed to disaggregate the efficacy of the different components of the intervention.

In this study we used an internal comparison design with multiple assessment points. The lack of comparison sites presents the possibility that the changes in screening and counseling rates were a reflection of broader preventive care changes within the HMO. However, the fact that the dramatic increases were replicated at specific intervention points in three geographically distinct clinics adds support to the findings. Future research should include both intervention and comparison sites for a more rigorous test of the preventive services intervention.

This intervention offers a promising approach to facilitate the implementation of national guidelines that recommend screening and counseling adolescents on a range of risky behaviors. Improving the delivery of preventive services is an essential step toward decreasing adolescent morbidity and mortality.

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NOTE

1. The Maternal and Child Health Bureau's Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents (Green and Palfrey 2000); the American Medical Association's Guidelines for Adolescent Preventive Services (Elster and Kuznets 1994); the U.S. Preventive Services Task Force's Guide to Clinical Preventive Services (1996); and the American Academy of Pediatrics' Health Supervision Guidelines (Stein 1997).

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