

## Pediatric Residency Training on Tobacco

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**ABSTRACT.** *Objective.* Pediatricians have a unique role to play in the antismoking arena. However, few pediatric residency training programs prepare residents to meet the tobacco challenge. This study evaluates the effects of a comprehensive pediatric residency training program on tobacco on resident tobacco intervention behaviors, as well as on changes in the behavior of patients and their parents/guardians.

*Methods.* Pediatric residents were exposed to a comprehensive training program on tobacco. Baseline and follow-up surveys of residents, parents/guardians, and patients were used to assess the effects of the training program. A quasi-experimental design permitted unambiguous evaluation of the program's effects on resident intervention behaviors.

*Results.* The comprehensive training program on tobacco led to marked and significant changes in resident intervention on tobacco. Many of these changes were supported by parents' and patients' reports. In turn, resident intervention on tobacco led to a significant increase in the likelihood that parents would maintain a "smoke-free household." Significant changes in the prevalence of parental smoking were not found, although the trend during 3 years of follow-up was in the desired direction. A high proportion of residents reported that they intervened on tobacco in patients at baseline and follow-up, but too few patients were sampled to permit analysis of the impact on changes in smoking.

*Conclusions.* Comprehensive training on tobacco had a positive and powerful effect on the tobacco intervention behavior of pediatric residents. In turn, intervention on tobacco by pediatric residents may have a significant impact on patients and their parents. These findings underscore the efficacy of pediatric residency training on tobacco, and it is hoped that they will serve as an impetus for other pediatric residency programs to introduce training on tobacco. *Pediatrics* 2001;108(1). URL: <http://www.pediatrics.org/cgi/content/full/108/1/e8>; *tobacco control and prevention, cigarette smoking, environmental tobacco smoke, residency training.*

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ABBREVIATIONS. ETS, environmental tobacco smoke; TAPS, Teenage Attitudes and Practice Survey; NJMS, New Jersey Medical School.

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Pediatricians have an important role to play in the antismoking arena.<sup>1</sup> Statements from the American Academy of Pediatrics<sup>2-4</sup> and the American Heart Association Committee on Atherosclerosis and Hypertension in Children,<sup>5</sup> as well as by individual investigators,<sup>6,7</sup> call on pediatricians to protect young people from the harmful effects of environmental tobacco smoke (ETS), to discourage smoking onset in children and adolescents, and to help patients and their parents who smoke or use other forms of tobacco to quit. Despite this, few pediatricians address tobacco,<sup>8-11</sup> and neither undergraduate medical education<sup>12</sup> nor residency training<sup>13</sup> is adequately preparing the next generation of pediatricians to take up the tobacco challenge. Although efforts to teach pediatric residents to intervene on tobacco hold considerable promise,<sup>14,15</sup> few programs include in their curriculum comprehensive training in intervention on tobacco, and pediatric residents are less active in the area of tobacco intervention than are residents in other medical disciplines.<sup>16</sup>

Shortcomings in pediatric training and practice represent important gaps in the United States' efforts to protect young people from tobacco-related disease and addiction. Approximately half of US children who are younger than 5 years are exposed to tobacco smoke, and for more than one quarter of the children, exposure begins before birth.<sup>17</sup> Forty percent of children in this age range live in a household with a smoker, and the probability of children's exposure to tobacco smoke doubles from the highest income and maternal education groups to the lowest.<sup>17</sup>

Adverse effects of ETS on children include increased lower respiratory infection; increased respiratory symptoms; reduced lung growth; exacerbation of asthma; irritation of the eyes, nose, throat, and lower respiratory tract; increased risk for middle-ear disease; and increased risk of sudden infant death.<sup>17</sup> Interventions to encourage parents to create smoke-free households and to curb smoking around children may be effective,<sup>18</sup> and pediatricians and pediatric residents can make a significant contribution in this area.

Children who become smokers place themselves at risk for a lifetime of addiction and premature morbidity and mortality from tobacco-related disease.<sup>19</sup> Despite this, ~3000 young people become regular smokers every day, and estimates of the number of cigarettes consumed annually by ~3 million children and adolescents in the United States have been placed conservatively at 516 million packs.<sup>19</sup> Ciga-

rette smoking among students in grades 9 to 12 increased from 27.5% in 1991% to 36.4% in 1997.<sup>20</sup> A large proportion of these students will continue to smoke throughout their adult life.<sup>21</sup>

Formal efforts to help young people quit smoking, either by educational and behavioral approaches<sup>22</sup> or by use of nicotine replacement therapy,<sup>23,24</sup> notably have been unsuccessful, yet young people want to stop smoking.<sup>25</sup> The 1993 Teenage Attitudes and Practice Survey (TAPS) showed that 84.5% of 12- to 19-year-old smokers had seriously thought about quitting, and 55.1% had tried to stop smoking during the preceding 6 months.<sup>26</sup> More recent surveys of high school students show that many young smokers try to quit on their own, but few succeed.<sup>27</sup> In a study in which high school students met in focus groups to talk about motivation to quit smoking, the 3 most powerful motivators were a message to quit from their boyfriend or girlfriend; the actual tobacco-caused suffering, illness, or death of a loved one; and a message from their personal physician telling them to quit.<sup>28</sup> The last finding underscores the important role that pediatricians may play in the antismoking arena.

Pediatricians also have a strong mandate from the parents of the patients they serve to address tobacco. A survey of parents in a pediatric practice setting<sup>29</sup> showed that almost all of the parents surveyed believed that the pediatrician should talk to parents about the effects of ETS on children and to children and adolescents about stopping smoking. Efforts to encourage parents of patients to quit smoking have not met with uniform success,<sup>30</sup> and pediatric office-based interventions on ETS, smoking cessation, and prevention of smoking onset remain important areas for research.

Cigarette smoking is a serious pediatric disease, and pediatric residency training programs must do more to prepare future pediatricians to address tobacco. The Pediatric Residency Training Program at the New Jersey Medical School (NJMS) has taken steps to meet this need. First, we assessed the extent to which pediatric residents at NJMS encourage patients and their parents to stop smoking, and we compared their performance with residents in medicine and psychiatry (baseline assessment). Second, we developed and initiated a training program on tobacco intervention (control of ETS, prevention of smoking onset, smoking and other tobacco use cessation) for pediatric residents. Third, we assessed the effects of the training program on pediatric resident intervention on tobacco in patients and their parents/guardians. Fourth, we determined the impact of resident intervention on changes in ETS exposure and tobacco use in patients and their parents. In the near future, we will determine the extent to which graduates of our residency program continue to intervene on tobacco when they enter clinical practice. The present report describes the nature of the training program, effects on resident intervention on tobacco, and changes in patient and parent/guardian tobacco use and exposure to ETS.

## METHODS

### Participants

#### *Pediatric Residents*

All 27 second- and third-year pediatric residents at NJMS who did not have a dual residency (eg, pediatrics and medicine, pediatrics and psychiatry) took part in the baseline assessment in June 1996 (year 1 of the study). This corresponds to the end of the 1995/1996 academic year, with third-year residents completing their residency training in June and new first-year residents entering the program in July 1996. Follow-up assessments of second- and third-year pediatric residents were conducted in June 1997 ( $N = 35$ ), 1998 ( $N = 38$ ), and 1999 ( $N = 28$ ) (ie, years 2, 3, and 4 of the study). A research assistant administered the surveys at resident training meetings, and all of the eligible residents participated. The training program on tobacco intervention was offered to all pediatric residents (first-, second-, and third-year residents) during years 2, 3, and 4 of the study.

#### *Medicine and Psychiatry Residents*

Twenty-two second- and third-year medicine residents and all ( $N = 23$ ) second- and third-year psychiatry residents took part in the baseline assessment in June 1996. As was the case with pediatric residents, residents with dual residencies were excluded from the study. In June 1999, 19 second- and third-year medical residents and all ( $N = 21$ ) second- and third-year psychiatry residents, excluding those with dual residencies, participated in a follow-up assessment. In 1996 and 1999, a research assistant distributed the surveys to second- and third-year residents in medicine at "morning report." All of the eligible residents in attendance cooperated with the survey. The surveys for the psychiatry residents were administered at meetings of the residents, and all of the eligible residents participated. The tobacco training program was not offered to residents in medicine and psychiatry.

#### *Parents*

Parents/guardians of patients (1 per family) who were attending the Continuity Clinic of the Department of Pediatrics at NJMS participated in baseline and follow-up tobacco surveys in September 1996 ( $N = 205$ ), 1997 ( $N = 213$ ), 1998 ( $N = 202$ ), and 1999 ( $N = 206$ ). A research assistant visited the Continuity Clinic daily in September of each year of the study and approached all of the parents/guardians who were in the waiting area. After explaining the nature of the survey and obtaining informed consent, the research assistant distributed the survey. Fewer than 3% of the parents refused to fill out the survey. Only data for parents/guardians who were not attending their first visit to the clinic were included in the present report, because those who were attending their first visit may not have met with the pediatric resident at the time that the survey was administered.

#### *Patients*

The vast majority of patients who were seen in the Continuity Clinic were newborns, infants, and toddlers, and it was possible to collect data only from a small sample of patients, ages 12 to 18 years, in the time allotted (month of September). The study of the impact of pediatric resident intervention on tobacco use in adolescent patients is continuing, and only some aspects of the available data are presented in this report.

Forty-seven patients, ages 12 to 18 years, participated in the youth tobacco survey at the start of the study (September 1996), and 50 patients participated in the youth tobacco survey in year 4 (September 1999). The research assistant approached the patients in the waiting area of the Continuity Clinic to explain the nature of the survey and to obtain informed consent (parental permission was required for participants who were younger than 18 years). The patients were encouraged to move to another area of the waiting room to fill out the survey to avoid being influenced by their parent or guardian. All of the youths who were approached filled out the survey.

### Design

A quasi-experimental design was used in which a survey of second- and third-year residents in pediatrics in June 1996 preceded the initiation of a formal training program on tobacco

(Baseline Tobacco and Substance Abuse Intervention Survey; see Table 1). The Baseline Tobacco and Substance Abuse Intervention Survey also was administered at the same time to second- and third-year residents in medicine and psychiatry. The training program, which was conducted from October to June of each year of follow-up, was initiated in October 1996 and repeated in 1997 and 1998 (Table 1). All first-, second-, and third-year pediatric residents took part in the training. The training program was not offered to residents in medicine and psychiatry.

A follow-up tobacco survey was administered to the second- and third-year pediatric residents in June 1997 and June 1998 (Table 1). In June 1999, the Tobacco and Substance Abuse Intervention Survey used at baseline was readministered to residents in pediatrics, medicine, and psychiatry. The surveys, which were filled out anonymously to promote candor, permitted assessment of changes in self-reported pediatric resident intervention on tobacco from baseline (year 1) through year 4, as well as comparisons with residents in psychiatry and medicine at baseline and year 4. To the extent that pediatric residents reveal significant increases in key tobacco intervention behaviors whereas medicine and psychiatric residents do not, the study supports the efficacy of the tobacco training program for pediatric residents.

The Tobacco and Substance Abuse Intervention Survey also collected information on intervention on alcohol and other drugs. The pediatric residents did not receive special training in alcohol or drug intervention during the course of the study. To the extent that the pediatric residents reveal a significant increase in intervention on tobacco while showing little or no change in intervention on alcohol and other drugs, the findings provide additional support for the efficacy of the pediatric training program on tobacco.

## Surveys

### *Baseline Tobacco and Substance Abuse Intervention Survey for Residents in Pediatrics, Medicine, and Psychiatry*

The "Substance Abuse Intervention Survey" assessed resident characteristics and demographic information, training and supervision in substance abuse (with separate sections of the survey for tobacco, alcohol, and other drugs), and key intervention behaviors. Questions about tobacco were drawn from surveys used in the Community Intervention Trial for Smoking Cessation to assess changes in physician tobacco intervention behaviors,<sup>30</sup> and comparable questions were used to assess intervention on alcohol and other drugs. The survey was administered at baseline (1996) and at the end of the study (1999) to residents in pediatrics, psychiatry, and medicine (Table 1).

### *Resident Tobacco Intervention Follow-up Survey*

The "Follow-up Survey," given to pediatric residents in years 2 and 3, assessed changes in resident intervention on tobacco and did not include questions about alcohol and other drugs. Most of the questions used in the Baseline Substance Abuse Survey to assess intervention on tobacco were repeated, and several questions were added to assess resident intervention on ETS and

prevention of smoking onset, areas that were not covered on the Baseline Substance Abuse Survey for residents in pediatrics, medicine, and psychiatry. Pediatric residents also were questioned in 1999 about intervention on ETS and prevention of smoking onset.

### *Baseline and Follow-up Parent/Guardian Tobacco Surveys*

The "Parent/Guardian Survey" was administered at baseline and years 2, 3, and 4 (Table 1) to separate samples of parents/guardians. The surveys assessed demographic and psychosocial factors, smoking behavior and use of other forms of tobacco, rules about smoking around children and/or in the home, smokers' quitting history, smokers' motivation to quit in the future, and parent/guardian reports about resident intervention on tobacco. Only the findings on parent/guardian reports of resident tobacco intervention behaviors and changes in parent/guardian tobacco use and ETS exposure are included in the present report.

### *Baseline and Follow-up Patient Tobacco Survey*

The "Patient Tobacco Survey" was given to patients, ages 12 to 18 years, at baseline and year 4 (Table 1), and it was based on a survey that was used to assess the smoking behavior of ninth-grade students in the Community Intervention Trial for Smoking Cessation.<sup>31</sup> The survey assessed patient psychosocial and demographic information, family smoking behavior, the patients' smoking behavior and use of other forms of tobacco, friends' smoking behavior, reports about pediatric resident intervention on tobacco, past smoking cessation attempts, and motivation for stopping smoking in the future. The findings on patient reports of resident tobacco intervention behaviors are highlighted in the present report.

## Resident Training in Tobacco Intervention

Because of competing demands on residents' time, a series of 1-hour training sessions were held during lunch hour once every 2 months on an annual basis. Each training session dealt with a different topic (Table 1). Session 1 ("Orientation") was held in October, Session 2 ("Environmental Tobacco Smoke") was held in December, Session 3 ("Cessation") was held in February, and Session 4 ("Prevention") was held in April. Additional "Supervision" Sessions were held 1 month after sessions 2, 3, and 4 to provide additional training in patient interviewing, to support the residents' attempts to intervene on tobacco, and to deal with problems as they arose. Because only some of the residents were available on any day, each session was repeated on 5 successive days to accommodate all of the residents.

The training sessions included didactic presentations, small group discussion, and role-playing. Residents were given background reading material and information about ETS, smoking cessation, and prevention, as well as training in interviewing, assessment, and behavior modification. Key concepts covered in training were Clinical Opportunities for Intervention on Tobacco<sup>32</sup> (eg, a child experiencing respiratory distress represents a unique clinical opportunity to talk to the parents about modifying ETS in the home); the National Cancer Institute's (NCI's) 4 A's algorithm

**TABLE 1.** Schedule of Events

Year 1 (1996)	
June	Baseline assessment of all residents (Substance Abuse Intervention Survey)
September	Baseline assessment of parents/guardians (Parent/Guardian Tobacco Survey)
September	Baseline assessment of patients (Patient Tobacco Survey)
October	Initiate pediatric residency training program on tobacco
Year 2 (1997)	
June	Follow-up assessment of pediatric residents (Tobacco Intervention Survey)
September	Follow-up assessment of parents/guardians (Parent/Guardian Tobacco Survey)
October	Continue pediatric residency training program on tobacco
Year 3 (1998)	
June	Follow-up assessment of pediatric residents (Tobacco Intervention Survey)
September	Follow-up assessment of parents/guardians (Parent/Guardian Tobacco Survey)
October	Continue pediatric residency training program on tobacco
Year 4 (1999)	
June	Follow-up assessment of all residents (Substance Abuse Intervention Survey)
September	Follow-up assessment of parents/guardians (Parent/Guardian Tobacco Survey)
September	Follow-up assessment of patients (Patient Tobacco Survey)
October	Continue pediatric residency training program on tobacco

(Ask, Advise, Assist, Arrange),<sup>32</sup> as well as a fifth A, Anticipate, for intervention with youths; stages of change; motivational interviewing; behavior modification (eg, stimulus control techniques, principles of reinforcement, behavioral contracting, goal specification, behavioral rehearsal); and brief behavioral and pharmacologic interventions for smoking cessation. These concepts were emphasized because we wanted residents to acquire skills and knowledge that ultimately could be applied in a variety of clinical settings when they complete their training and enter practice. Intervention on other forms of tobacco was not stressed because so few patients and parents used other forms of tobacco.

### Intervention Packets for Patients and Parents/Guardians

Special intervention materials were developed and assembled into packets for use by residents with patients and parents. Separate packets were available for intervention on ETS, smoking cessation in youths and parents, and prevention of smoking onset. Materials were available in Spanish and English, and special materials on ETS and cessation were prepared for parents of newborns. Residents used the packets when they counseled patients and parents, reviewing the contents of the packet and agreeing on a plan of action. The packets contained patient information material, self-help behavior-change manuals, and a host of behavior-change aids (eg, cigarette self-monitoring cards, "Smoke-Free Household" signs, information on diet and exercise), as well as behavioral contracts for codifying agreed-on behavior-change strategies.

### Clinic Mobilization

Posters were placed in the waiting area and examining rooms and rotated periodically to maintain interest and attention. Brochures and pamphlets on ETS, smoking and health, and how to stop smoking or create a smoke-free household were available in the waiting area and on display racks. Residents recorded tobacco intervention encounters in progress notes, and stickers were placed on charts to identify smokers. Orientation and training sessions were held for faculty and staff to familiarize them with the project, materials, and the important role that they play in supporting the residents and in encouraging patient and parent changes in tobacco exposure and use.

### Statistics

The  $\chi^2$  test of proportions was used to compare differences in the proportion of residents in pediatrics, medicine, and psychiatry who intervened on tobacco, alcohol, and other drugs in parents/patients. The  $\chi^2$  test also was used to compare changes at baseline and follow-up in the proportion of residents in pediatrics, medicine, and psychiatry who intervened on tobacco, alcohol, and other drugs in parents/patients. Although data for pediatric residents were available on an annual basis, most of the comparisons were restricted to baseline and year 4 to ensure that the samples at each time point were independent of one another.

The  $\chi^2$  test of proportions also was used to compare changes over time in parent/guardian and patient reports of resident intervention activities and in changes in tobacco use and exposure to ETS. Post hoc analyses (linear and logistic regressions) were used to identify year-to-year changes. Because there was no overlap among the annual samples of parents/guardians, it was possible to include data from each annual survey in the analyses. The

patient data were collected at baseline and year 4 and analyzed via the  $\chi^2$  test of proportions.

Additional logistic regression procedures were used to assess the relationship between demographic and resident intervention variables and 2 key outcome variables for parents/guardians: smoking status (smoke vs do not smoke) and creation of a smoke-free household. For these analyses, variables that are known to influence smoking behavior (gender, race/ethnicity, education, spouse smokes, number of household members that smoke) and variables that are unique to the present study and that may have an impact on the outcome variables (year of study, length of time attended clinic, did resident ask whether you smoke, did resident advise you to quit smoking, did resident offer to help you quit smoking, did child's doctor [resident] advise you not to smoke around children, did child's doctor [resident] offer to help you stop exposing your children to ETS) were used.

## RESULTS

### Baseline Comparisons Between Residents in Pediatrics, Medicine, and Psychiatry

#### Demographic Characteristics

The demographic characteristics of residents in each discipline measured at baseline did not differ significantly from the characteristics measured in year 4 (data not shown). Moreover, the racial composition of the residents in each discipline was similar (38% Asian, 29% non-Hispanic white, 16% non-Hispanic black, and 9% Hispanic, for all residents combined). Residents in psychiatry were older than residents in pediatrics and medicine (mean age at baseline: 37.30 [SD = 5.69] for residents in psychiatry compared with 30.95 [SD = 4.27] and 32.21 [SD = 5.35] for residents in medicine and pediatrics, respectively [F = 9.53; P < .01]), and a larger proportion of residents in pediatrics were female (63% at baseline) than residents in medicine (27%) and psychiatry (26%) ( $\chi^2 = 10.787$ ; P < .05).

#### Intervention on Tobacco at Baseline

At baseline, residents in medicine (95%) and psychiatry (74%) were significantly more likely than residents in pediatrics (33%) to report that they tried to help a patient/parent stop smoking during the past year ( $\chi^2 = 21.75$ ; P < .01; Table 2), whereas a high proportion of residents in each discipline reported that they routinely asked patients/parents whether they smoked, advised patients/parents to stop smoking, and informed patients/parents about the hazards of smoking (Table 3). Significantly more residents in medicine (50%) and psychiatry (54%) than in pediatrics (18%) reported that they routinely provided assistance to patients/parents who wanted

**TABLE 2.** Resident Intervention on Tobacco at Baseline and Year 4

During the Past Year, Did You Try to Help Patients/Parents? (Yes) [n (%)]	Year 1 (Baseline)			Year 4		
	Ped (n = 27)	Med (n = 22)	Psych (n = 23)	Ped (n = 28)	Med (n = 19)	Psych (n = 21)
Stop smoking	9 (33)	21 (95)	17 (74)	22 (79)*	10 (53)*	12 (57)
Modify their alcohol intake (reduce or abstain)	5 (21)	20 (91)	19 (83)	8 (30)	12 (67)	18 (86)
Modify drug use (reduce or abstain)	6 (23)	15 (88)	23 (100)	9 (33)	9 (50)†	17 (81)

Ped indicates resident in pediatrics; Med, resident in medicine; Psych, resident in psychiatry.

\*  $\chi^2$  significant, P < .01.

†  $\chi^2$  significant, P < .05.

**TABLE 3.** Resident Intervention on Tobacco at Baseline and Year 4

During Clinical Contacts With Parents/ Patients, Do You? (Yes) [n (%)]	Year 1 (Baseline)			Year 4		
	Ped (n = 27)	Med (n = 22)	Psych (n = 23)	Ped (n = 28)	Med (n = 19)	Psych (n = 21)
Ask about smoking	24 (89)	21 (95)	21 (91)	28 (100)	18 (95)	20 (95)
Advise cessation	21 (78)	19 (86)	16 (70)	28 (100)*	18 (95)	14 (67)
Assist cessation	5 (18)	11 (50)	11 (48)	15 (54)*	11 (58)	7 (33)
Arrange follow-up	2 (7)	3 (14)	5 (22)	7 (25)	8 (42)†	5 (24)
Inform patients/parents about hazards of smoking	17 (63)	17 (77)	18 (78)	27 (96)*	18 (95)	14 (67)
Offer brochure on smoking or health	4 (15)	2 (9)	4 (17)	24 (86)*	4 (21)	5 (24)
Offer brochure on how to quit smoking	1 (4)	2 (9)	2 (9)	24 (86)*	3 (16)	3 (14)
Encourage quit date	8 (30)	8 (36)	7 (30)	11 (39)	7 (37)	5 (24)
Encourage nicotine replacement therapy	3 (11)	7 (33)	18 (78)	9 (32)	11 (58)	16 (76)
Counsel patients/parents who want to quit	6 (22)	11 (50)	8 (35)	15 (54)†	10 (53)	11 (52)

Ped indicates resident in pediatrics; Med, resident in medicine; Psych, resident in psychiatry.

\*  $\chi^2$  significant,  $P < .01$ .

†  $\chi^2$  significant,  $P < .05$ .

to stop smoking ( $\chi^2 = 6.66$ ;  $P < .05$ ; Table 3). Residents in medicine (33%) and psychiatry (78%) also were significantly more likely than residents in pediatrics (11%) to report that they encouraged patients/parents to use nicotine replacement therapy to quit smoking ( $\chi^2 = 24.23$ ;  $P < .01$ ). Relatively few residents in any discipline reported that they provided smoking and health brochures or self-help stop-smoking pamphlets, encouraged quit dates, or provided follow-up support to patients/parents who were trying to stop smoking (Table 3).

#### Intervention on Alcohol at Baseline

As shown in Table 2, the proportion of pediatric residents who reported at baseline that they tried to help patients/parents modify their alcohol intake (21%) during the past year was significantly lower

than the proportions for medicine (91%) and psychiatry (83%;  $\chi^2 = 29.69$ ,  $P < .01$ ). Although a high proportion of residents in each discipline reported that they ask patients/parents whether they drink alcohol, residents in psychiatry and, to a lesser extent, medicine, were much more likely than residents in pediatrics to actively intervene (Table 4).

#### Intervention on Drugs at Baseline

Residents in medicine and psychiatry were more likely than residents in pediatrics to report that during the past year they had tried to help patients/parents modify drug use ( $\chi^2 = 27.56$ ,  $P < .01$ ; Table 2). A high proportion of residents in each discipline ask about drug abuse, inform patients/parents about the health hazards of illicit drug use, and advise patients/parents who use drugs to stop (Table 5).

**TABLE 4.** Resident Intervention on Alcohol at Baseline and Year 4

During Clinical Contacts With Parents/ Patients, Do You? (Yes) [n (%)]	Year 1 (Baseline)			Year 4		
	Ped (n = 27)	Med (n = 22)	Psych (n = 23)	Ped (n = 28)	Med (n = 19)	Psych (n = 21)
Ask patients/parents whether they drink alcohol	19 (70)	22 (96)	21 (91)	19 (68)	18 (95)	21 (100)
Use formal questionnaire to assess alcohol problems	0 (0)	5 (23)	7 (30)	7 (25)*	9 (47)	11 (52)
Advise "problem" or moderate drinkers to reduce their intake of alcohol to lower level	7 (26)	13 (59)	10 (43)	9 (32)	14 (74)	13 (62)
Advise males who drink to limit intake to no more than 2 alcoholic beverages per occasion	8 (30)	6 (27)	8 (35)	9 (32)	6 (32)	9 (43)
Advise females who drink to limit intake to no more than 2 alcoholic beverages per occasion	7 (26)	4 (18)	6 (26)	9 (32)	5 (26)	9 (43)
Inform patients/parents about hazards of excessive alcohol intake	14 (52)	18 (82)	23 (100)	13 (46)	15 (79)	21 (100)
Refer alcohol-dependent/alcoholic patients/ parents to special treatment programs	5 (19)	14 (64)	20 (87)	5 (18)	12 (63)	19 (90)
Provide "brief intervention" to help "problem" or moderate drinkers to reduce their alcohol intake	2 (7)	4 (18)	10 (43)	1 (4)	5 (26)	6 (29)
Distribute brochures/information about harmful effects of alcohol	2 (7)	2 (9)	3 (13)	3 (11)	6 (32)	5 (24)
Use pharmacologic agents to help alcoholic or heavily alcohol-dependent patients/parents to abstain	1 (4)	2 (9)	10 (43)	1 (4)	2 (11)	4 (19)
Provide follow-up support to patients/parents trying to modify alcohol intake	2 (4)	10 (45)	15 (65)	3 (5)	4 (21)	13 (62)

Ped indicates residents in pediatrics; Med, residents in medicine; Psych, residents in psychiatry.

\*  $\chi^2$  significant,  $P < .01$ .

**TABLE 5.** Resident Intervention on Illicit Drugs at Baseline and Year 4

During Clinical Contacts With Parents/ Patients, Do You? (Yes) [n (%)]	Year 1 (Baseline)			Year 4		
	Ped (n = 27)	Med (n = 22)	Psych (n = 23)	Ped (n = 28)	Med (n = 19)	Psych (n = 21)
Ask patients/parents whether they use illicit drugs	19 (70)	20 (91)	11 (48)	23 (82)	18 (95)	19 (90)*
Use a formal questionnaire to assess drug problems	1 (4)	3 (14)	5 (22)	2 (7)	2 (11)	7 (33)
Advise patients/parents who use illicit drugs to stop	16 (60)	16 (73)	12 (52)	14 (50)	15 (79)	17 (81)†
Advise patients/parents who use illicit drugs only on occasion to reduce drug use	5 (19)	4 (18)	5 (22)	9 (32)	5 (26)	11 (52)†
Inform suspected patients/parents about health hazards of drug abuse	13 (48)	14 (64)	12 (52)	13 (46)	16 (84)	18 (86)†
Refer drug-abusing patients/parents to special treatment programs	4 (15)	12 (55)	11 (48)	2 (7)	6 (32)	15 (71)
Provide brief intervention to help drug abusers to reduce their drug use	1 (4)	9 (41)	8 (35)	2 (7)	5 (26)	8 (38)
Distribute brochures/information about the harmful effects of illicit drugs	2 (7)	2 (9)	4 (17)	3 (11)	3 (16)	5 (24)
Use pharmacologic agents to help drug abusers stop	2 (7)	4 (18)	7 (30)	2 (7)	3 (16)	9 (43)
Provide follow-up support to patients/ parents trying to modify drug use	5 (19)	6 (27)	10 (43)	2 (7)	3 (16)	12 (57)

Ped indicates residents in pediatrics; Med, residents in medicine; Psych, residents in psychiatry.

\*  $\chi^2$  significant,  $P < .01$ .

†  $\chi^2$  significant,  $P < .05$ .

Few, however, provide assistance in the form of referrals, brief interventions, or pharmacologic therapy (Table 5). However, residents in medicine and psychiatry were more likely to report such assistance than residents in pediatrics (Table 5).

#### Change in Intervention Activities From Baseline to Year 4 for Residents in Pediatrics, Medicine, and Psychiatry

Table 2 shows that the proportion of pediatric residents who reported that they tried to help patients/parents stop smoking increased significantly from 33% at baseline to 79% at year 4. For the same time periods, the proportion of residents in medicine and psychiatry who reported that they tried to help patients/parents stop smoking either did not change significantly or decreased (Table 2). These findings are consistent with the hypothesis that the training program on tobacco for pediatric residents increased pediatric resident intervention on tobacco.

Table 2 also shows that the proportion of pediatric residents who reported that during the past year they tried to help patients/parents modify alcohol or drug use did not increase significantly from baseline to year 4. Similarly, the proportions of residents in medicine and psychiatry who reported that they tried to help patients/parents modify alcohol and drug use either remained unchanged or decreased (Table 2). These findings also are consistent with the study hypothesis. That is, that pediatric residents increased their intervention on tobacco while revealing little or no change in intervention on alcohol and other drugs is consistent with the hypothesis that the increase in pediatric resident intervention on tobacco is due to the implementation of the training program on tobacco.

With respect to specific interventions on tobacco,

marked and significant increases in intervention activities were observed for pediatric residents but not for residents in medicine and psychiatry (Table 3). Significant increases from baseline to year 4 were observed for the proportion of pediatric residents who reported that they advised patients/parents to stop smoking, assisted cessation, informed patients/parents about the hazards of smoking, provided brochures and pamphlets, and counseled patients/parents to quit smoking. Few significant changes occurred among residents in medicine and psychiatry (Table 3). In some cases, a “ceiling” may have been reached so that there was little opportunity to reveal significant increases (eg, the proportion of residents in medicine who reported that they advised cessation was 86% at baseline, leaving little room for significant improvement at year 4). In many other instances, there was considerable room for increases, but significant increases in behavior were not observed (eg, Table 3; assist cessation and distribute brochures on smoking and health for residents in medicine and psychiatry).

As shown in Table 4, few changes in specific interventions on alcohol were observed among residents in pediatrics, medicine, and psychiatry from baseline to year 4. A similar finding held true for intervention on other drug use for residents in pediatrics and medicine (Table 5). However, a larger proportion of residents in psychiatry reported intervention on drugs in year 4 than they did at baseline (Table 5).

#### Pediatric Resident Intervention on ETS and Prevention of Smoking Onset

Questions concerning pediatric resident intervention on ETS and prevention of smoking onset were included for the first time on the surveys adminis-

**TABLE 6.** Pediatric Resident Intervention on ETS and Prevention of Smoking Onset

Parameter [n (%)]	Year 2 (n = 35)	Year 4 (n = 28)
During the past year, did you speak to patients/parents about ETS? (yes)	34 (96)	28 (100)
During clinical contacts with patients/parents, do you? (yes)		
Inform patients/parents about hazards of ETS	25 (71)	26 (93)*
Advise parents to create smoke-free household	21 (60)	24 (86)*
Advise parents not to expose young children to ETS	28 (80)	28 (100)*
Assist parents to modify ETS	11 (31)	14 (50)†
During the past year, did you try to prevent smoking onset in patients? (yes)	24 (69)	32 (73)

ETS indicates environmental tobacco smoke.

\*  $\chi^2$  significant,  $P < .01$ .

†  $\chi^2$  significant,  $P < .05$ .

tered in year 2 and were repeated on the years 3 and 4 surveys for pediatric residents. Table 6 shows that in years 2 and 4, virtually all of the residents reported that they had spoken to patients/parents about ETS during the past year. The proportion of pediatric residents who reported that they informed patients/parents about the hazards of ETS, advised parents to create a smoke-free household, advised parents not to expose young children to ETS, and helped parents to modify ETS in the home and elsewhere increased significantly from year 2 to year 4. The proportion of residents who reported that during the past year they had tried to prevent smoking onset in patients remained unchanged at ~70% (Table 6). Unfortunately, resident self-report data on intervention on ETS and prevention of smoking onset before the initiation of the training program are not available. However, baseline parent and patient reports of resident intervention on ETS and prevention of smoking onset are available (see below).

### Parent/Guardian Reports of Pediatric Resident Intervention on Tobacco

The samples of parents who were surveyed at baseline and at years 2, 3, and 4 were demographically similar. The average age of the respondents was 29.31 years (SD = 9.35), and they had an average of 2.40 children (SD = 1.79). Ninety percent of the respondents were female, and the vast majority of them were African American (74%). Seventeen percent were Hispanic, 4% were white, and 1.4% were Asian. Twenty-eight percent of the respondents had less than a high school education, and only 9% had graduated college. Only 23% of the respondents reported that they currently were married, and 80% had an income of \$20 000 per year or less. Forty-eight percent had an income of less than \$10 000 per year. At baseline, 36% of the parents/guardians smoked cigarettes, and 55% of the households had at least 1 smoker.

Although parental reports of resident intervention on tobacco generally were lower than the residents' self-report, there is a considerable degree of congruence between the 2 sets of data. As shown in Table 7, the proportion of parents/guardians who reported that the resident asked them about smoking (all participants) and advised them to quit smoking (smokers only) increased significantly over time (post hoc Bonferroni linear analyses showed that subsequent years were higher than baseline). Similar significant increases were found for the proportion of smokers who reported that the resident provided self-help cessation materials (18% to 56%) and counseling for smoking cessation (8% to 44%). There was little or no change in the proportion of parents/guardians who reported that the resident prescribed nicotine replacement therapy or provided follow-up, and the absolute number of residents who engaged in these activities was low. The proportion of parent/guardian smokers who reported that the residents offered to help them stop smoking was surprisingly high at baseline and follow-up, although the proportion did

**TABLE 7.** Parent/Guardian Report of Resident Intervention on Tobacco

During the Past Year, Did Resident? (Yes)	Year			
	1 (Baseline) (n = 140)* (n = 50)†	2 (n = 166)* (n = 56)†	3 (n = 155)* (n = 36)†	4 (n = 178)* (n = 55)†
Ask about smoking (all participants)	56%	58%	68%	71%
Advise cessation (smokers only)‡	41%	70%	81%	72%
Assist cessation (smokers only)	65%	70%	86%	72%
Discuss health hazards of smoking (smokers only)	26%	38%	50%	38%
Provide self-help cessation materials (smokers only)‡	18%	29%	28%	56%
Provide counseling for smoking cessation (smokers only)‡	8%	5%	11%	44%
Prescribe nicotine replacement therapy (smokers only)	8%	5%	3%	4%
Speak to you about ETS (all participants)‡	24%	34%	50%	51%
Help you stop exposing your children to ETS (all participants)§	5%	5%	8%	10%
Help you stop exposing your children to ETS (smokers only)§	9%	6%	17%	17%
Provide self-help material to modify ETS (all participants)‡	3%	7%	6%	13%

\* Number of all participants.

† Number of smokers.

‡  $\chi^2$  significant,  $P < .01$ .

§  $\chi^2$  significant,  $P < .05$ .

not increase significantly during the course of the study (Table 7).

The proportions of parents/guardians who reported that pediatric residents spoke to them about ETS, offered to help them stop exposing their children to ETS, and provided self-help material to modify ETS increased significantly from year 1 (baseline) to year 4 (Table 7).

### Changes in Parent/Guardian Smoking Behavior and Exposure to ETS

#### Smoking Behavior

Table 8 shows that the prevalence of parent/guardian smoking behavior declined from 36% at year 1 (baseline) to 31% at year 4. Although this decline was in the expected direction, the change in the proportion of smokers over time failed to achieve statistical significance. The proportion of smokers who reported that they currently were trying to stop smoking, although high, also failed to reveal a significant change from baseline.

Logistic regression analyses showed that the number of household members who smoke significantly and independently increased the likelihood that a parent/guardian smoked cigarettes (odds ratio [OR]: 3.928; Table 9). That is, the more household members who smoked cigarettes, the greater the likelihood that the parent/guardian was a smoker. Variables that decreased the likelihood that a parent/guardian smoked included duration of time attending the clinic (OR: 0.277), doctor advice about quitting (OR: 0.146), and doctor offering to help them quit (OR: 0.036). The latter findings suggest that pediatric resident intervention on tobacco may have had a significant positive impact on parent/guardian smoking rates. Perhaps, additional years of intervention and follow-up are necessary to demonstrate significant decreases in parent/guardian smoking rates.

#### Environmental Tobacco Smoke

Table 10 shows that there was a significant increase in the proportion of parents/guardians who reported creating a smoke-free household (40% at baseline to 53% at year 4) and asking visitors to smoke outside the home (35% to 43%). Logistic regression showed that number of household members who smoked decreased the likelihood of creating a smoke-free household (OR: 0.232), whereas an affirmative answer to the question, "Did your child's doctor offer to help you stop exposing your child to ETS?" was significantly and independently associ-

**TABLE 9.** Logistic Regression for "Do You Smoke" (Parent/Guardian)

Variable	Odds Ratio	Confidence Limits	
		Lower	Upper
Year of study	0.756	0.429	1.331
Gender	0.106	0.011	1.018
Race/ethnicity	0.752	0.263	2.155
Education	1.957	0.926	4.136
Spouse smokes	0.612	0.373	1.005
Number of household members who smoke	3.928	1.905	8.1
Length of time attended clinic	0.277	0.127	0.605
Did resident ask whether you smoke?	1.757	0.765	4.035
Did resident advise you to quit smoking?	0.146	0.036	0.586
Did resident offer to help you quit smoking?	0.036	0.006	0.207

ated with creating a smoke-free household in parents who did not smoke cigarettes (OR: 2.122; Table 11).

### Patient Reports of Resident Intervention on Tobacco

The demographic characteristics of the patients, of course, reflect those of their parents/guardians described above. Moreover, characteristics of the patient samples obtained in 1996 and 1999 were very similar. Sixty-six percent and 56% of the youths who were surveyed in 1996 and 1999, respectively, were female, and their average age was approximately 15 years.

Few of the youths currently smoked cigarettes. Thirty percent of the patients who were surveyed at baseline reported that they ever smoked, whereas only 12% of those surveyed in year 4 had ever smoked. Only 1 of the baseline ever-smokers reported having smoked 100 cigarettes in his/her lifetime, and 7 (15%) had smoked in the past month. None of the patients surveyed in year 4 reported that they smoked 100 cigarettes in their lifetime or smoked in the past month.

There was little difference in patient reports of resident intervention on tobacco at baseline and year 4. At baseline, 60% of the patients reported that the resident had asked them whether they smoked, 42% indicated that the resident had spoken with them about the dangers of smoking, and 54% said that the resident had talked with them about not starting to smoke. In year 4, 58% of the patients reported that the resident had asked about smoking, 54% said that the resident had talked to them about the dangers of

**TABLE 8.** Changes in Parent/Guardian Smoking Behavior

Parameter	Year			
	1 (Baseline) (n = 140)* (n = 50)†	2 (n = 166)* (n = 56)†	3 (n = 155)* (n = 36)†	4 (n = 178)* (n = 55)†
Do you smoke cigarettes? (yes) (all participants)	36%	34%	23%	31%
Are you currently trying to stop smoking? (yes) (current smokers only)	61%	47%	44%	44%

\* Number of all participants.

† Number of smokers.

**TABLE 10.** Changes in Rules Concerning Environmental Tobacco Smoke (Parent/Guardian Surveys)

Variable	Year			
	1 (Baseline) (n = 140)	2 (n = 166)	3 (n = 155)	4 (n = 178)
Smoke-free household* (all participants)	40%	41%	57%	53%
Sit in no-smoking sections of restaurants (all participants)	41%	32%	40%	42%
Ask people not to smoke in my presence (all participants)	32%	28%	31%	33%
Ask visitors to smoke outside not in the house† (all participants)	35%	30%	46%	43%
Sit in no-smoking section of train (all participants)	25%	24%	21%	26%

\*  $\chi^2$  significant,  $P < .01$ .†  $\chi^2$  significant,  $P < .05$ .

smoking, and 56% reported that the resident had talked with them about not starting to smoke. Of the 7 patients who reported that they had smoked in the past month at baseline, 4 reported that the resident had offered to help them stop smoking. These data are consistent with the resident's self-reports of intervention on tobacco with patients, and they are consistent with a fairly high level of intervention at baseline and year 4. Additional data collection is necessary before commenting any further about the decline in the prevalence of smoking from baseline to year 4.

### DISCUSSION

The baseline comparisons among residents in pediatrics, medicine, and psychiatry, like previous studies,<sup>16</sup> showed that pediatric residents were less likely to intervene on tobacco than were residents in the other disciplines. Although a large proportion of residents in each discipline reported that they had asked about smoking and advised patients/parents to quit, residents in medicine and psychiatry were significantly more likely to actively intervene to help smokers quit smoking than were residents in pediatrics. One reason for this may be the greater likelihood that residents in medicine and, perhaps, psychiatry, see patients with serious tobacco-related disease and symptoms. In addition, residents in medicine and psychiatry are more likely than residents in pediatrics to be called on to assist inpatients who smoke and, perhaps, to prescribe nicotine replacement therapy to inpatients who are experiencing nicotine withdrawal. It also is likely that many pediatric residents and their supervising faculty simply do not believe that it is the pediatrician's responsibility to address tobacco in the parents of their patients, much less prescribe nicotine replacement or other pharmacologic therapies.

Pediatric residents do see adolescents who smoke on the wards, in outpatient clinics, and in community settings (note: only adolescents seen in Continuity Clinic contributed to the survey data collected in the present study), and they also routinely come into contact with parents who smoke. Such parents expose their children to the harmful effects of ETS, and they serve as role models for the next generation of nicotine addicts. Statements from the American

Academy of Pediatrics<sup>2-4</sup> call on pediatricians to play an active role in the antismoking arena, and residency training is an appropriate time to prepare future pediatricians to meet the tobacco challenge. In this article, we described a comprehensive training program on tobacco and demonstrated its efficacy.

We chose to evaluate the impact of the training program on tobacco by surveying residents, patients, and parents, and we used Continuity Clinic as our "training grounds," although the residents undoubtedly took their newly acquired skills and knowledge to other practice settings (inpatient, adolescent clinic, specialty clinics, community settings, etc.). The advantage of Continuity Clinic over most other settings for training on intervention on tobacco is that residents have opportunities to follow the same patient and his or her family for an extended period of time (3 years). The opportunity for long-term follow-up is helpful for learning about the pediatrician's role in initial cessation, long-term follow-up, and nonsmoking maintenance.

We did not have the resources to carry out a large scale randomized study, but we are confident that the quasi-experimental design used permits unambiguous evaluation of the effects of the pediatric residency training program on tobacco. The key issue that the quasi-experimental design addressed was whether changes in pediatric resident intervention on tobacco are attributable to the training program or to other factors, such as, say, increasing interest among the pediatric and medical communities in substance abuse since 1996. We addressed this issue by showing 1) that pediatric residents became more active in intervention on tobacco after the introduction of the training program during the same time period in which levels of intervention on alcohol and other drugs did not increase, and 2) that residents in other disciplines, who were not exposed to the training program on tobacco, did not reveal significant changes in levels of tobacco intervention. Moreover, by asking patients and parents about pediatric resident intervention on tobacco in 1996 and 1999, it was possible to corroborate the residents' self-reports.

Resident self-report data, as well as surveys of parents and patients, show that the 3-year training program had a significant positive impact on pedi-

atric resident intervention on tobacco. The proportion of residents who reported that during the past year they had tried to help patients/parents stop smoking increased from 33% to 79%, a finding that was corroborated by a significant increase in parents who reported that residents provided counseling for smoking cessation and self-help cessation materials. Residents also reported significant increases in intervention on ETS, findings that also were corroborated by parent reports.

Naturally, there were differences between resident self-reports and parent/patient reports. In general, a higher proportion of residents reported having delivered various interventions than the proportion of parents/patients who reported having received the interventions. This discrepancy may arise from many factors. The training program emphasized the importance of assessing "stage of change" and delivering appropriate stage-dependent interventions.<sup>31</sup> Hence, many parents and possibly patients who smoked may not have been deemed ready for, say, assistance in stopping smoking and would not have been offered immediate assistance. Instead, they may have been encouraged to read a brochure on smoking and health in an attempt to increase their readiness for change.

It also should be noted that the training program encouraged residents to practice various interventions (which most did). However, residents are extremely busy, as is the Continuity Clinic, and there is no question that residents were not able to intervene with all smokers all of the time. In addition, patients and families enter and leave the clinic rolls "constantly" throughout the year. Hence, it is not surprising that the evaluation sampling procedures underestimate the proportion of parents and patients who report having received intervention.

Despite the instability of the patient/parent population and sampling difficulties, the outcome analyses suggest that patients and parents benefited from resident intervention on tobacco. Although the prevalence of parent/guardian smoking did not decline significantly from 1996 to 1999, the decline did approach significant levels ( $P = .08$ ), and logistic re-

gression analysis showed that the likelihood of parent/guardian smoking was inversely related to length of time attending the clinic, resident advice to quit smoking, and resident offers to assist cessation attempt.

There was a significant increase in the proportion of parents who reported maintaining a smoke-free household, and logistic regression showed that the likelihood of maintaining a smoke-free household was positively related to the residents' offer to help them stop exposing their children to ETS. These are particularly important findings because the population served by the Continuity Clinic is a poor, urban population that greatly experiences adverse health effects of ETS. Few of the mothers are married, almost half reported an income of less than \$10 000 per year, 28% did not graduate high school, and at baseline, the smoking rate among parents/guardians was 36%. Approximately 55% of the households had at least 1 smoker at baseline.

A recent unpublished NJMS survey showed that asthma hospitalization rates in Newark for children younger than 14 years are 4 to 5 times higher than the state rate and even higher when the comparison is restricted to more affluent suburban settings. Rates of asthma, respiratory infections, and other ETS-related illnesses (eg, otitis media) that are treated in the Continuity Clinic also are extremely high. To say the least, this is an underserved population with few, if any, resources available to them for assistance with smoking cessation or control of ETS. If pediatricians and residents do not take advantage of clinical opportunities to provide assistance in the area of tobacco prevention and control with this population, who will? Our 3-year data show that the residents had a positive impact on the tobacco practices of the parent/guardian population, and we believe that the impact will grow as the program is continued and fully integrated into the residency training curriculum. If practical, future studies of resident intervention on smoking and ETS should include measures of change in tobacco-related morbidity as well as changes in resident, parent, and patient behavior.

The data on youth smoking were compromised by the small numbers of adolescents who were seen in Continuity Clinic, as well as by the small number of smokers who were sampled at follow-up. In the future, it may be important to expand the evaluation to include youths who are seen in other clinics (eg, adolescent clinic), as well as on the hospital wards. Approximately 70% of the residents reported that they had tried to prevent smoking onset in patients at baseline and year 4. The youths tended to corroborate the residents' report. The training program emphasized the importance of asking patients about smoking, assessing risk factors for smoking onset, and using role playing to help youths acquire skills to cope with pressures to smoke. Proven interventions to help adolescents quit smoking are few and far between, and the development of interventions specifically designed for pediatricians' offices and clinics is an important priority for the future.<sup>32</sup>

**TABLE 11.** Logistic Regression for Smoke-Free Household (Parent/Guardian)

Variable	Odds Ratio	Confidence Limits	
		Lower	Upper
Year of study	1.323	0.965	1.814
Gender	1.210	0.396	3.694
Race/ethnicity	1.622	0.949	2.773
Education	0.955	0.676	1.348
Spouse smokes	1.122	0.477	2.639
Number of household members who smoke	0.232	0.132	0.411
Length of time attended clinic	0.795	0.548	1.156
Did child's doctor (resident) advise you not to smoke around children?	1.021	0.547	1.906
Did child's doctor (resident) offer to help you stop exposing your children to ETS?	2.122	1.061	4.242

## CONCLUSION

The present study documented the efficacy and importance of training pediatric residents to intervene effectively on tobacco. We also provided data that underscored the need for training pediatric residents to intervene on alcohol and other drugs. Although Tables 4 and 5 showed that a high proportion of residents in each discipline asked about alcohol and other drugs, pediatric residents were less likely than residents in medicine and psychiatry to provide brief interventions to help parents/patients modify alcohol or drug use. Fortunately, many of the same skills required to address tobacco effectively can be used to address alcohol and other drugs. In the present study, no effort was made to stress the generality of the tobacco interventions to avoid compromising our control conditions. In the future, it may be wise to emphasize the generality of the interventions and to demonstrate how the various interventions may be applied artfully to a wide range of substances and behaviors.

Finally, it is important to comment on the significance of our findings for pediatric residency training and practicing pediatricians in general. We firmly agree with authorities in the field that pediatricians have a unique and important role in the anti-tobacco arena. Residency training is an ideal time to prepare residents to take up the tobacco challenge, and our data demonstrate the efficacy of such training. The true test of the impact of the program, however, will come when our residents enter clinical practice. It is hoped that they will join a new generation of physicians who view cigarette smoking and exposure to ETS as vital signs that require comprehensive and systematic intervention.<sup>33</sup>

Our approach to residency training on tobacco was comprehensive and labor intensive, and we recognize that many pediatric residency training programs are not equipped or able to devote the same resources to tobacco prevention and control. There is a definite need to explore other models and approaches to resident training on tobacco and for different programs to select and implement approaches that are most appropriate to their program. But select and implement they must, because the adverse effects of cigarette smoking, other tobacco use, and ETS are matters of highest concern, and it is necessary for the pediatric community to step forward to protect young people and their families from a lifetime of addiction and tobacco-related disease.

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