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# Pediatrician Counseling About Preventive Health Topics: Results From the Physicians' Practices Survey, 1998–1999

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**ABSTRACT.** *Objective.* Government agencies and national organizations recommend that physicians counsel their child and adolescent patients about preventive health topics. Using data from a national survey, we describe the counseling patterns of pediatricians in regard to 9 recommended preventive health topics.

*Methodology.* Between October 1998 and April 1999, information was collected from 907 of 1760 primary care pediatricians randomly selected from a nationally representative sample. Through either a telephone interview or a mail survey, pediatricians were asked how frequently in the past month they counseled about 9 preventive health topics during the well-care visits or routine check-ups of their patients. Pediatricians answered questions regarding their patients aged 2 to 5, 6 to 12, and 13 to 18 years.

*Results.* Over 80% of the pediatricians counseled about 1 or more recommended preventive health topics during the well-care visits or routine check-ups of their patients. As compared with pediatricians who did not counsel about any topic, pediatricians who counseled were significantly more likely to be female and spend longer amounts of time with their patients during these visits. The frequency with which specific preventive health topics were discussed varied with the topic and the age of the patient.

*Conclusion.* Most pediatricians routinely counsel about some, but not all, recommended preventive health topics. An understanding of why pediatricians selectively counsel about specific topics is needed. *Pediatrics* 2002;109(5). URL: <http://www.pediatrics.org/cgi/content/full/109/5/e83>; *pediatrician, counseling, preventive health services, physician's practice patterns.*

ABBREVIATIONS. AMA, American Medical Association; HMO, health maintenance organization.

The health behaviors of young people may increase or decrease their risk for many acute and chronic conditions. For example, the risk for acute conditions such as injury, unplanned pregnancy, and poor physical development can be re-

duced by using seatbelts, using contraception, and maintaining adequate nutrition, respectively. The risk for chronic health conditions in adulthood can also be influenced by behaviors initiated during youth. For example, smoking and obesity are risk factors for a multitude of chronic health conditions including cancer<sup>1,2</sup> and cardiovascular disease.<sup>1,2</sup> These risk factors, in part, have their origins in childhood: 82% of adults who smoke tried their first cigarette before 18 years of age,<sup>3</sup> and 25% to 50% of children who are obese as children remain so as adults.<sup>4,5</sup> As such, the promotion of preventive health behaviors in youth is important.

One avenue for promotion of preventive health behaviors is the physician office visit as most youth have contact with a physician. In 1994, for example, 94% of children under 5 years of age and 79% of children 6 to 17 years of age had a least 1 physician office visit.<sup>6</sup> Numerous government agencies and national organizations also recommend clinical preventive interventions. The US Preventive Services' *Guide to Clinical Preventive Services*,<sup>7</sup> the Maternal and Child Health Bureau's *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*,<sup>8</sup> the American Medical Association's (AMA) *Guidelines for Adolescent Preventive Services*,<sup>9</sup> and the American Academy of Pediatrics' *Guidelines for Health Supervision III*<sup>10</sup> all include recommendations that physicians who treat children or adolescents talk to their patients or their caregivers about preventive health topics. Across the documents, a multitude of topics are suggested, including nutrition, tobacco use, physical activity, safety, sexual activity, and substance abuse. The pediatrician's decision to discuss any or all of these topics is likely influenced by a multitude of factors. Theoretic models suggest that these factors include characteristics of the physician and of the patient.<sup>11,12</sup>

Numerous studies have documented the frequency pediatricians discuss preventive health topics.<sup>13–26</sup> However, these studies have limitations that affect the usefulness of their results. First, most have included only a limited number of topics such as gun safety or other injuries,<sup>13–18</sup> physical activity,<sup>19</sup> smoking,<sup>20</sup> sexual activity,<sup>21</sup> or 3 cardiovascular disease risk factors.<sup>22</sup> Second, studies that did include multiple preventive health topics were limited because they queried about patients in a select age group, in particular adolescents,<sup>23,24</sup> or about patients of all ages as a single group.<sup>25–26</sup> This later grouping may be inappropriate because the fre-

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quency pediatricians counsel about certain topics may vary with the age of the patient.<sup>22</sup> Third, most studies may be limited in generalizability because samples were selected from pediatric residents only,<sup>18</sup> select regional areas,<sup>13,15–16,20–21,23–24</sup> specific types of practice settings,<sup>23–24</sup> or membership lists of professional organizations.<sup>14–17,20,22,25–26</sup>

In this analysis of data collected in 1998–1999 from a randomly selected national sample of pediatricians who were engaged in primary care, we attempted to extend the findings of these previous studies by addressing the following questions:

1. What proportion of pediatricians always counsel about 1 or more preventive health topics at the well-care visits or routine check-ups of their patients?
2. What are the characteristics of pediatricians who always counsel about 1 or more preventive health topics at the well-care visits or routine check-ups of their patients?
3. What proportion of pediatricians always counsel about specific preventive health topics (eg, physical activity) and do these counseling practices vary by the age of patients?

## METHODS

### Study Population

The target population for this survey consisted of pediatricians who treated  $\geq 10$  children or adolescents (ages 2–18 years) per week and whose practice was focused on primary care. Potential participants were selected from the AMA Physician Masterfile,<sup>27</sup> which contains biographic, medical education, and current practice data on all US physicians. Included are both members and nonmembers of the AMA as well as graduates of foreign medical schools living in the United States who meet education standards for recognition as physicians. Records for physicians are initiated on their entry into medical school (or at licensure in the United States for physicians who do not attend US medical schools) and are updated approximately every 3 to 4 years.

In June 1998, 61 172 physicians in the AMA Physician Masterfile identified themselves as pediatricians. To best achieve a sample representative of our target population, we eliminated pediatricians with the following characteristics before the random selection: doctors of osteopathy ( $N = 1151$ ) as these physicians may have had different training with regard to prevention and would not be sampled in sufficient numbers to adjust for this difference; record of disciplinary action ( $N = 757$ ); dead or vital status being determined ( $N = 3996$ ); born before 1938, as these physicians were likely to be retired ( $N = 9411$ ); graduated from medical school after 1995, as these physicians were likely to be residents ( $N = 6879$ ); did not provide direct patient care ( $N = 8977$ ); and a foreign medical school graduate temporarily practicing in the United States or a US citizen practicing in a foreign country ( $N = 666$ ). In all, a total of 29 335 physicians were eligible for our selection. Of these, we then eliminated physicians for the following practical reasons related to the conduct of our study: did not provide a US mailing address ( $N = 1556$ ), did not provide a phone number ( $N = 11 683$ ), and asked not to be contacted ( $N = 183$ ). Those physicians excluded for practical reasons ( $N = 13 422$ ) were not significantly different from those not eliminated ( $N = 15 913$ ) by mean age, or percentages who were male, board-certified, foreign medical graduates, or living in specific geographical regions. Of the remaining 15 913 physicians, we randomly selected 1760 for this survey. This number was chosen to provide national prevalence estimates ( $\pm 4\%$ ) for counseling assuming 10% ineligibles not detected through the sampling process and 40% nonrespondents.

### Study Design

This study was originally designed as a telephone survey. One week before telephone calls began, all participants were sent a

letter that described the study. The telephone survey, conducted between October 1998 and December 1998, was done by trained interviewers who used a standardized questionnaire and simultaneously entered data using a computer-assisted telephone system. At least 8 attempts were made to contact each physician at his or her office; attempts were made on various days and at various times of day. In addition, physicians or their office assistants were provided a toll-free number for the physician to call and to schedule an interview. At the end of the 3-month survey period, 674 (38%) of the 1760 selected physicians had been contacted and screened. To improve response, a written version of the questionnaire with identical wording was mailed to all nonrespondents. After 2 mailings, an additional 338 pediatricians were contacted and screened for a total contact rate of 57.5% (1012/1760). Among the 1012 contacted, 102 were not eligible for the study (15 were retired; 2 were medical residents; 29 were not pediatricians; 44 were not in primary care; and 12 treated fewer than 10 children each week). Of the 910 pediatricians determined to be eligible for the study, 3 refused to participate; thus, 907 were potentially available for our analysis.

### Analytic Population

Because we compared the counseling practices of pediatricians across the age groups of their patients, we excluded 56 of the 907 who were eligible as they did not see patients in all 3 age groups of interest; 4 of these 56 saw adolescent patients only. Of the remaining 851, we excluded another 56 because they were missing information on covariates ( $N = 7$ ) or 1 or more counseling behaviors ( $N = 49$ ). Of those missing information on counseling, 71% were missing information on only 1 behavior for 1 group. Thus, our final analytic population included 795 pediatricians.

### Questionnaire

The questionnaire was designed to be administered over the telephone in 15 to 20 minutes. Topics were selected by their relevance to the original study objective of characterizing the counseling practices of pediatricians. Information collected included the pediatrician's demographic, behavioral, and medical practice characteristics and the counseling practices relative to 9 preventive behaviors. The 9 preventive topics were selected because recommendations about these behaviors appeared consistently across several guidelines.<sup>7–10</sup> Because previous research indicated that physician counseling practices might vary by patient age,<sup>22</sup> we asked about counseling practices for 3 age groups of patients: 2 to 5 years, 6 to 12 years, and 13 to 18 years. Questions on a topic were first asked for a specific age group, and topics were asked in the same order for all age groups. Six of the 9 topics (seatbelt or car seat use, firearm safety, tobacco use by others in the home, maintenance of a healthy weight, physical activity, and nutrition) were asked for patients of all ages. Questions were asked about tobacco use and alcohol/drug use by the youth for patients aged 6 to 12 years and 13 to 18 years only, and contraception and protection against sexually transmitted diseases for patients 13 to 18 years of age only. The questionnaire was reviewed by an advisory panel and was piloted among a small number of pediatricians. A copy can be obtained from the first author on request.

### Definition of Counseling

To determine whether a pediatrician regularly counseled on a specific topic, we asked the following question: "Thinking about well-care visits or routine check-ups of your patients during the past month, how frequently did you talk to the child (adolescent) or their caregiver about [topic]?" Participants were asked to respond: a) always; b) most times; c) sometimes; or d) never. Pediatricians who said they "always" counseled about a topic were defined as a regular counselor on that topic. For each pediatrician, we summed the number of topics on which he or she "always" counseled. Those who "always" counseled on one or more preventive health topics were defined as regular counselors of preventive health.

### Definition of Covariates

We selected 6 covariates previously hypothesized to be associated with physician counseling. These included 3 demographic characteristics of the pediatrician: sex, age ( $<45$  years vs  $\geq 45$

years), and region of practice (Midwest [Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin], Northeast [Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont], South [Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia], and West [Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming]); and 3 practice characteristics of the pediatrician: practice in a staff model health maintenance organization (HMO; yes, no), the average number of patients seen in each age group for well-care visits or routine check-ups ( $\leq 10$ , 11–20,  $> 20$ ), and the average length of a well-care visit or routine check-up for patients in each age group ( $\leq 15$  minutes, 16–20 minutes,  $> 20$  minutes).

## Data Analysis

Statistical analyses were completed using SAS version 6.08 (SAS, Inc, Cary, NC). To evaluate whether the pediatrician's characteristics were associated with being a regular counselor on preventive health, we used multiple variable logistic regression.<sup>28</sup> To compare the prevalence of regular counseling on specific topics across patient age groups, we treated the reports for each of the 3 age groups as a repeated measure for that pediatrician and conducted a repeated-measures analysis using PROC CATMOD.<sup>29</sup> We tested differences in the prevalence of regular counseling for 3 a priori hypothesized contrasts of age groups: 2 to 5 versus 6 to 12, 6 to 12 versus 13 to 18, and 2 to 5 versus 13 to 18.

## RESULTS

### Description of Population

The mean age of the survey sample was 45 years with males (56% of respondents) slightly older than females (46 years vs 42 years). The respondents were fairly evenly distributed among the Midwest (22%),

Northeast (26%), South (31%), and West (21%). Most were board-certified (92%) and members of the American Academy of Pediatrics (89%). More than three-fourths participated in private practice arrangements (20% were solo, and 59% were in a group) with the remaining physicians in either a staff model health maintenance organization (8%) or another arrangement (13%). The median weekly number of patients aged 2 to 18 seen for well-care visits or routine check-ups was 45.

1) What proportion of pediatricians always counseled on 1 or more preventive health topics at well-care visits or routine check-ups?

For each age group, over 80% of pediatricians regularly counseled patients on at least 1 topic;  $< 11\%$  counseled on all topics (Table 1). The median number of topics regularly discussed was as follows by age group: 2 to 5 years, 2 (of 6); 6 to 12 years, 3 (of 8); 13 to 18 years, 5 (of 9; data not shown).

2) What were the characteristics of pediatricians who always counseled on 1 or more preventive health topics at well-care visits or routine check-ups?

Across each age group of patients, 2 characteristics were significantly associated with regular counseling on 1 or more topics: the pediatrician's sex and the average time spent with patients during well-care visits or routine check-ups. Female pediatricians had 2.4 to 3.0 times the odds of regular counseling as male pediatricians and pediatricians who saw patients for  $> 20$  minutes during well-care visits had 2.2

**TABLE 1.** Characteristics of Pediatricians Who Always Counsel About 1 or More Preventive Health Topics: Physicians' Practices Study, 1998–1999

Category	Patients Aged 2 to 5 Years			Patients Aged 6 to 12 Years			Patients Aged 13 to 18 Years		
	n	%*	AOR† (95% CI)	n	%	AOR (95% CI)	n	%	AOR (95% CI)
Total	795	84.0	—	795	81.2	—	795	86.3	—
Sex									
Male	442	79.0	1.0†	442	74.4	1.0†	442	81.0	1.0†
Female	353	90.4	2.4 (1.5–3.7)	353	89.8	3.0 (2.0–4.6)	353	92.9	2.4 (1.4–3.9)
Age (y)									
$< 45$	415	85.1	1.0	415	81.5	1.0	415	88.4	1.0
$\geq 45$	380	83.0	1.1 (0.7–1.6)	380	81.0	1.3 (0.9–2.0)	380	84.0	0.8 (0.5–1.3)
Region									
Midwest	174	90.0	2.1 (1.1–4.0)	174	86.2	2.0 (1.1–3.7)	174	89.1	2.0 (1.1–3.9)
Northeast	203	83.3	1.2 (0.7–2.1)	203	84.2	1.7 (1.0–2.9)	203	91.6	2.7 (1.4–5.3)
South	249	83.5	1.4 (0.8–2.4)	249	78.3	1.3 (0.8–2.1)	249	83.9	1.5 (0.9–2.7)
West	169	80.0	1.0	169	76.9	1.0	169	80.5	1.0†
Works in HMO									
No	63	84.0	1.0	63	81.0	1.0	63	87.3	1.0
Yes	732	84.1	1.1 (0.5–2.2)	732	81.3	1.0 (0.5–2.0)	732	86.2	1.1 (0.5–2.6)
Average number of patients seen for well-care visits (per wk)									
$\leq 10$	148	81.8	1.0	552	80.8	1.0	578	85.3	1.0
11–20	258	83.7	1.2 (0.7–2.2)	114	80.7	1.2 (0.8–1.8)	157	86.6	1.2 (0.7–2.1)
$> 20$	389	85.1	1.5 (0.9–2.5)	165	83.0	1.3 (0.8–2.2)	60	95.0	3.2 (1.0–11.0)
Average time per patient in well-care visits									
$\leq 15$ min	378	78.6	1.0†	360	74.4	1.0†	230	73.5	1.0†
16–20 min	271	89.3	2.1 (1.3–3.4)	248	84.3	1.7 (1.1–2.7)	234	88.9	2.6 (1.5–4.4)
$> 20$ min	146	88.4	2.2 (1.2–3.9)	187	90.4	3.2 (1.8–5.6)	331	93.4	4.4 (2.6–7.7)

CI indicates confidence interval.

\* Percentage of pediatricians in the category who always counsel about 1 or more preventive health topics.

† Adjusted odds ratio-adjusted for all other listed covariates.

‡ Variable (as a group) is significant at  $P < .05$ .



to 4.4 times the odds of counseling as those who saw patients for  $\leq 15$  minutes (Table 1). The only significant differences by region were for patients aged 13 to 18 years; in this group, pediatricians in the Midwest or Northeast had 2.0 and 2.7 times the odds of counseling patients as those in the West. Characteristics not significantly associated with counseling were the pediatrician's age, the pediatrician's participation in a staff model HMO, and the number of patients the pediatrician saw weekly for well-care visits or routine check-ups.

To test whether method of response affected results, we reran all models with the inclusion of a variable to identify the method by which the pediatrician responded to the survey (1 = mail, 0 = telephone). There were no appreciable differences in the estimated odds ratios for any of the 3 models. Similar patterns in counseling also were observed when we considered the median number of topics for which the pediatrician counseled instead of the proportion of pediatricians who counseled about one or more topics (data not shown).

3) *What proportion of pediatricians always counseled about specific preventive health topics, and did these counseling practices vary by the patient's age?*

The proportion of pediatricians who regularly counseled on specific topics varied by topic and by the patient's age (Table 2). Among the 6 topics pertinent to all 3 age groups, the 1 with the highest prevalence of regular counseling was diet and nutrition: 62.1% to 71.1% across the 3 age groups (Table 2). Maintenance of a healthy weight (range: 49.3% to 56.1%), seatbelt or car seat use (range: 44.7% to 47.8%), physical activity (range: 41.4% to 58.7%), and tobacco use by others in the home (range: 33.8% to 50.6%) were the next most frequent topics. Counseling about firearm safety ranked far below the other topics (range: 14.8% to 24.8%).

For most topics, pediatricians were more likely to always counsel their older patients. The most strik-

ing increases by patient age were observed for the patient's tobacco use and the patient's drug and alcohol use, for which pediatricians were more than twice as likely to counsel their 13- to 18-year-old patients than those 6 to 12 years. In contrast, pediatricians were more likely to counsel those patients aged 2 to 5 years than those who were older about seatbelt or car seat use and diet or nutrition.

When we repeated the analysis for Table 2 but changed the definition of regularly counseling to include the responses "always" or "most times" instead of just "always," we found as expected that the proportion of pediatricians who regularly counseled increased. The patterns within and between age groups remained the same.

## DISCUSSION

From this national survey of the counseling practices of pediatricians, we document the following findings: 1) during the well-care visits or routine check-ups of their patients, over 80% of US pediatricians counsel on 1 or more recommended preventive health topics; 2) female pediatricians (vs male) and pediatricians who spend more time with their patients during well-care visits or routine check-ups counsel more frequently; and 3) the frequency with which specific preventive health topics are discussed seems to vary by the topic and the patient's age.

Our first finding of a high rate of counseling is encouraging but not surprising. Pediatricians consider many preventive health topics as important, and pediatricians who perceive topics as important have been found to counsel on them more frequently. In a recent survey of primary care pediatricians by Cheng and colleagues,<sup>25</sup> topics such as growth and nutrition, car safety, gun safety, and the harm of passive smoking were all rated as important by over 80% of pediatricians; for each topic, the pediatrician's perception of its importance was positively related to his or her likelihood of counseling about it.

**TABLE 2.** Percentage of Pediatricians Who Always Counsel About a Preventive Topic by the Age Group of the Patient: Physicians' Practices Survey, 1998–1999

Topic	Patient Age Group			P Value for Age Group Contrasts		
	2–5 Years	6–12 Years	13–18 Years	2–5 Years Versus 6–12 Years	6–12 Years Versus 13–18 Years	2–5 Years Versus 13–18 Years
Seatbelt or car seat use for the child/adolescent	47.8	44.7	44.7	.0183	1.000	.0455
Firearm safety	14.8	19.0	24.8	<.0001	<.0001	<.0001
Tobacco use by others in the child's/adolescent's home	33.8	39.0	50.6	<.0001	<.0001	<.0001
Tobacco use by the child/adolescent	NA	29.4	69.4	NA	<.0001	NA
Maintenance of a healthy weight for the child/adolescent	49.3	49.9	56.1	.6779	<.0001	<.0001
Physical activity for the child/adolescent	41.4	51.3	58.7	<.0001	<.0001	<.0001
Diet or nutrition for the child/adolescent	71.1	62.1	62.3	<.0001	.9146	<.0001
Child's/adolescent's use of alcohol and drugs	NA	24.3	69.7	NA	<.0001	NA
Contraception and protection against sexually transmitted diseases for the adolescent	NA	NA	48.6	NA	NA	NA

NA indicates not applicable.

\* NA as this question was not asked about patients in this age group.

The credibility of preventive service guidelines created by numerous government and professional organizations is another factor that likely contributes to our encouraging observation.<sup>7-10</sup> For example, in the survey by Cheng and colleagues, guidelines from the American Academy of Pediatrics were rated as important in determining the content and emphasis of health supervision visits by 78% of pediatricians.<sup>25</sup> It should be noted, however, that not all pediatricians find guidelines useful; in a recent national survey of pediatricians, the most cited reason for not using guidelines was that guidelines did not allow for clinical judgment.<sup>30</sup>

Our second finding—that pediatricians who spent more time with patients and who were female were each more likely to counsel—is also not surprising. With regard to time, perceived lack of time is a frequently cited barrier to providing preventive services.<sup>18,25,31</sup> Our survey extends these findings by demonstrating that actual time for a visit correlates with the provision of services. With regard to the pediatrician's sex, other studies have found as we did that female physicians are more likely to counsel than male physicians on preventive health topics<sup>17,26,32</sup> or to provide preventive health services.<sup>33-35</sup> The explanation for the differential by sex is not known; some have hypothesized that females are more likely to provide preventive health services because they spend more time with their patients.<sup>36</sup> In our study, female pediatricians spent on average 5 minutes more with their patients than did male pediatricians, but the effect of sex was evident even after controlling for the average length of visit. An understanding as to what other factors cause the gender differential may improve the specificity of education interventions for pediatricians.

Despite our optimistic finding that most pediatricians counsel about at least 1 preventive health topic, our data shows that they do not counsel about all recommended topics. This may, in part, be attributable to time restrictions. Our study showed that visit time with patients is short: For patients aged 2 to 5 years the median length of well-care visits or routine check-ups was 16 minutes, and for those aged 6 to 12 or 13 to 18 years, it was 19 minutes. During this brief time, pediatricians are expected not only to counsel about preventive topics, but also to take a medical history, perform physical examinations, conduct relevant screening procedures, give immunizations, and address appropriate psychological issues.

How then do physicians determine which preventive health topics they will give priority? Our third finding suggests that the counseling practices of pediatricians are influenced both by the patient's age and the topic. Our findings on age are consistent with those reported in the 1985 survey of pediatricians by Nader and colleagues,<sup>22</sup> who found that the frequency with which pediatricians counseled on topics related to cardiovascular risk (in particular exercise) changed with the patient's age. To explain why the patient's age influences counseling practices, we hypothesize that pediatricians may counsel their patients on topics they judge to have most immediate importance. For example, our finding that

counseling patients on smoking and drug and alcohol use increased significantly between patients aged 6 to 12 years and patients 13 to 18 years parallels the much greater likelihood that adolescents will engage in these behaviors. Studies in adults show similar findings in that patients with heart disease are more likely to be counseled about smoking,<sup>37</sup> those with chronic diseases are more likely to be counseled about exercise,<sup>38</sup> and those with diabetes are more likely to be counseled about weight loss.<sup>39</sup>

Another factor that might influence the priority given a topic is the pediatrician's perception of their ability to provide effective counseling messages; pediatricians are more likely to counsel about topics for which they have a high degree of confidence in their skills and for which they feel they can cause change.<sup>25</sup> Counseling patterns in our study are consistent with this hypothesis. For example, in our study patients of all ages are frequently counseled about nutrition: In Cheng's study, 98% of pediatrician's had a high level of confidence in their counseling about this topic, and 88% strongly felt they could prevent the problem.<sup>25</sup> In contrast, in our study, gun safety is least frequently discussed: In Cheng's study only 68% of pediatricians had a high level of confidence in their counseling about this topic, and only 38% strongly felt they could prevent the problem.<sup>25</sup>

Our findings should be viewed in the context of several limitations. First, only half of the eligible subjects participated in our study. Using auxiliary data available to us, we found that respondents and nonrespondents did not differ by sex or age. Unmeasured factors potentially related to counseling may, however, have influenced the choice to participate. Therefore, we cannot truly predict whether the nonparticipation biased our results. Second, our estimates of the prevalence of counseling are based on self-report. We are unaware of studies specifically validating pediatrician's report of counseling with their actual practice, but it is certainly possible that the practices reported in our study represent a best-case scenario, in part because counseling is socially desirable behavior and therefore likely to be overestimated. For example, Pbert and colleagues<sup>40</sup> found that among physicians who reported providing advice on smoking cessation, only 71% of the episodes could be verified by audiotape. Third, our estimates may be biased because some physician's answered our survey by telephone and others answered by mail. In our study, accounting for the response method did not affect the results of the logistic regression models. However, the prevalence of counseling for those who responded by telephone as compared with those who responded by mail differed significantly for 6 of the 23 age-specific counseling behaviors. This number of differences is unlikely to be caused by chance. However, we could not determine whether this finding was caused by the difference in methodology or real differences between the 2 groups of respondents; compared with those who responded to the telephone survey those who responded to the mail survey tended to be younger, see fewer patients, and spend less time with patients.

Fourth, our assessment of the prevalence of counseling does not reflect its quality, and thus we cannot report the prevalence of effective counseling. Future studies should examine the issue of quality by documenting the specific activities undertaken when a pediatrician counsels about a topic. Fifth, the generalizability of our results is limited to our target population, and may not apply to all practicing pediatricians.

These limitations notwithstanding, our study indicates clearly that counseling about prevention is on the minds of most pediatricians, and that they consistently counsel about some but not all recommended topics. If more recommended topics are to be included in preventive care visits, the factors that influence the content of these visits must be better understood. Studies to investigate these factors should consider the role of the individual physician, the health delivery system, and the physician's patients and peers in determining the content of these visits. Studies should also document the quality of counseling as well as system supports to the implementation of counseling. Obtaining this information will help determine whether interventions to alter counseling behavior should be designed to enhance pediatricians' knowledge and skills, to alter environmental barriers to counseling such as lack of time, or to reinforce desired counseling practices.<sup>11,12</sup>

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