Delivery of Smoking Prevention and Cessation Services to Adolescents

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Objectives: To describe the delivery of smoking prevention and cessation screening and counseling practices to adolescents and to examine the effect of physician specialty, sex, practice characteristics, and familiarity with preventive care guidelines on the delivery of smoking cessation counseling services.

Methods: Cross-sectional self-reported survey of pediatricians and family physicians in 3 New York metropolitan statistical areas who had seen 1 or more adolescents for well care within the past 6 months.

Results: Of 564 eligible physicians, 371 (66%) responded. Physicians reported asking most adolescents about smoking (91%) but were less likely to ask about peer smoking use (41%) or smokeless tobacco use (32%). Similarly, they reported assessing motivation to quit for 81% of smokers, but less often helped set quit dates (34%) or scheduled follow-up visits (28%). Family physicians were more likely to provide more effective smoking cessation interactions than pediatricians (mean smoking counseling performance score, 61 vs 53; \( P < .001 \)). Family physicians were also more likely to be familiar with National Cancer Institute guidelines than pediatricians (48% vs 27%; \( P < .001 \)). Female physicians reported having spent more time with their last adolescent patient (mean, 26 vs 21 minutes; \( P < .001 \)) and more often spent time alone with adolescent patients (85% vs 76% of visits; \( P < .001 \)) than did male physicians. In multivariate modeling, specialty, familiarity with National Cancer Institute guidelines, time spent, and confidentiality factors were associated with better smoking counseling performance.

Conclusion: Familiarity with smoking cessation guidelines and physician’s specialty and practice style with adolescents are associated with better delivery of tobacco cessation counseling to adolescents.


Despite efforts to prevent cigarette smoking, tobacco use remains an endemic health problem in the United States. More than 1 in 3 adolescents smoke, and as many as 20% of high school boys report using smokeless tobacco.1 Because most smokers begin using tobacco during adolescence, preventing and reducing tobacco use among youth has substantial long-term health benefits to society.

Tobacco cessation counseling by physicians and other clinicians has been shown to increase cessation rates among adult patients.2-6 Effective adult cessation interventions have been found to include setting quit dates, using multiple communication modalities, scheduling follow-up visits, and consistently reinforcing stop smoking messages.5,7 These specific activities have also been recommended for adolescents.7,8 In addition to the recommendations of the National Cancer Institute’s (NCI’s) physician guide to smoking cessation, “How to Help Your Patients Stop Smoking,”8 tobacco prevention and cessation counseling have also been recommended by numerous preventive service guidelines, including the American Academy of Pediatrics’ Guidelines for Child Health Supervision II,9 the American Medical Association’s Guidelines for Adolescent Preventive Services,10 the American Academy of Family Physicians’ age charts for periodic health examinations,11 the Maternal and Child Health Bureau’s Bright Futures guidelines,12 the US Preventive Services Task Force’s Guide to Clinical Preventive Services,13 and the US Public Health Service’s Put Prevention Into Practice campaign.14 Despite the existence of these guidelines, there are no published studies, to our knowledge, that address the effectiveness of brief clinical tobacco cessation interventions with adolescents. And although clinical trials are under way, it is unclear whether these adult interven-
SUBJECTS AND METHODS

SAMPLE

Using the American Medical Association’s Masterfile, we selected a random sample of 661 pediatricians and family physicians from the Buffalo, Rochester, and Syracuse, NY, metropolitan statistical areas in 1999. Physicians were mailed a self-administered questionnaire about the health services they routinely provide to adolescent patients. Physicians were considered eligible for the study if they had seen 1 or more adolescents for a well-patient visit in the 6 months before receiving our survey.

MEASURES

Items included questions about physician and practice demographics, including sex and specialty. We also asked about the physician’s usual screening and counseling practices with adolescent patients, and about the estimated amount of time spent with patients during adolescent well-care visits. Additional questions addressed the services offered during the physician’s most recent adolescent preventive visit. Physicians were also asked to estimate the proportion of their patients (aged 15-18 years) to whom they provided specific tobacco prevention and cessation services recommended by 1 or more preventive service guidelines. These services included asking about smoking habits, smokeless tobacco use, parental smoking, and friends’ cigarette use; reinforcing nonsmokers’ decisions to remain abstinent; and discussing the health risks of tobacco use. We also asked respondents to estimate the proportion of smokers whom they asked about motivation to quit, provided cessation-related handouts, helped set a quit date, and scheduled follow-up visits for smoking cessation. These items we constructed similarly to those used in other recent studies15,16 of preventive service delivery by primary care physicians. An overall tobacco counseling performance score (range, 0-100) was computed for physicians responding to all 10 of these questions. This score, the average of the percentage of adolescents the physician estimated performing each of the targeted screening and counseling practices with, was calculated by summing the 10 proportions, and dividing by 10. Physicians were also asked to rate their familiarity with each of 7 preventive care and tobacco intervention guidelines, using a 3-point Likert scale ranging from 1 (‘have never heard of these’) to 5 (‘have read all or most’ of these).

PROCEDURES

Reminder letters were sent to nonrespondents 2 to 4 weeks after the initial mailing, followed by telephone reminders and, as needed, third mailings. Physicians who had not seen adolescent patients for well-care visits in the previous 6 months (n=86) were ineligible for our survey. An additional 24 physicians were excluded as they had moved, died, or retired, leaving 551 eligible physicians (83% of the original Masterfile sample). Each physician received a $20 honorarium with the survey mailing. The study protocol was approved by the University of Rochester School of Medicine Research Subjects Review Board.

ANALYSIS

We used independent t tests to compare differences in performance of recommended tobacco screening and counseling interventions by physicians’ demographics, practice characteristics, and familiarity with guidelines. A χ2 test and an analysis of variance were used to examine proportions and means in stratified analyses. We also used multivariate linear regression models to assess the correlation between factors associated with physicians’ overall tobacco screening and counseling performance. All variables found to be significantly related in bivariate analyses were entered into our initial model, and variables found to be significant at P<.05 were retained. First-degree interactions were tested for as a group, and none were found to be significant. Coefficients and partial R² scores are described for variables with a significant association with the tobacco counseling performance score; the partial R² can be viewed as a reflection of the relative amount of variance in the score that can be explained by each specific variable.

RESULTS

Of the 551 eligible physicians, 156 (28%) did not respond, 24 (4%) refused to participate, and 371 (67%) returned completed surveys (percentages do not total 100 because of rounding). Respondents included 192 (75%) of 256 pediatricians and 179 (61%) of 295 family physicians. Male physicians made up 68% and female physicians 32% of the respondents. Approximately one third of the respondents were from Buffalo, Rochester, or Syracuse. Response rates were not statistically different for physician sex, type of practice setting, or geographic area. However, when comparing physician sex by specialty, male family physicians had a higher response rate than female family physicians (64% vs 49%; P=.04). The mean year of medical school graduation was later for female than for male respondents (1984 vs 1976; P<.001), but it was not significantly different by specialty or geographic area. Respondents from Buffalo and Rochester reported spending more of their adolescent visits on preventive care encounters than did physicians from Syracuse (44% and 40% vs 34%; F=5.1; P=.007).

SMOKING, SCREENING, AND COUNSELING PRACTICES

Overall, physicians reported asking 91% of their adolescent patients about their smoking habits, and discuss-
ing the health risks of tobacco with 77% of adolescents. Parental smoking, peer smoking, and personal smokeless tobacco use were reportedly discussed with 56%, 41%, and 32% of adolescents, respectively. The physicians reported reinforcing abstinence from tobacco use with 84% of nonsmoking patients. Among adolescents identified as smokers, physicians reported assessing motivation to quit among 81%, providing cessation handouts to 40%, helping set quit dates with 34%, and scheduling smoking-related follow-up visits with 28%.

Pediatricians reported asking more patients about peer influences than did family physicians (Table 1). Family physicians, however, reported more often asking about smokeless tobacco use, assessing motivation to quit, providing cessation handouts, helping set quit dates, and scheduling follow-up visits for smoking.

Physician sex also was associated with differences in smoking cessation and prevention counseling practices in bivariate analyses (Table 2). Female physicians were more likely than male physicians to ask about family or peer smoking, and were also more likely to report reinforcing abstinence from tobacco use with nonsmoking patients. Male physicians, however, were more likely to report asking about smokeless tobacco use. When controlled for specialty, female physicians remained more likely than male physicians to ask about peers (P < .001) and to reinforce nonsmokers’ abstinence (P = .02) (data not shown).

Familiarity with smoking cessation guidelines differed by specialty (Table 3). Not surprisingly, pediatricians were most familiar with the American Academy of Pediatrics’ Guidelines for Child Health Supervision II and family physicians were most familiar with the American Academy of Family Physicians’ age charts for periodic health examinations. Family physicians were also more likely than pediatricians to report having read some or all of the NCI’s Physician Guide, the US Preventive Services Task Force’s Guide to Clinical Preventive Services, and the US Public Health Service’s Put Prevention Into Practice program. In contrast, pediatricians reported greater familiarity with the American Medical Association’s Guidelines for Adolescent Preventive Services and with the Maternal and Child Health Bureau’s Bright Futures guidelines.

**FACTORS PREDICTING SMOKING COUNSELING PERFORMANCE**

The median performance score, representing overall performance of the 10 recommended screening and coun-

### Table 1. Adolescent Patients on Whom Physicians Routinely Perform Specific Tobacco Screening and Counseling Interventions, by Physicians Specialty, New York State, 1999*

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Pediatricians (n = 142)</th>
<th>Family Physicians (n = 179)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>For all adolescent patients</td>
<td>91</td>
<td>91</td>
<td>.88</td>
</tr>
<tr>
<td>Ask about smoking habits</td>
<td>24</td>
<td>41</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Ask about smokeless tobacco use</td>
<td>76</td>
<td>78</td>
<td>.36</td>
</tr>
<tr>
<td>Ask about friends’ smoking</td>
<td>50</td>
<td>31</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Discuss health risks of tobacco</td>
<td>84</td>
<td>84</td>
<td>.80</td>
</tr>
<tr>
<td>For nonsmoking patients</td>
<td>77</td>
<td>86</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Provide cessation handouts</td>
<td>32</td>
<td>49</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Help set a quit date</td>
<td>19</td>
<td>49</td>
<td>.001</td>
</tr>
<tr>
<td>Schedule follow-up for tobacco use</td>
<td>15</td>
<td>41</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

* Data are given as the mean percentage of adolescent patients unless otherwise indicated.

### Table 2. Adolescent Patients on Whom Physicians Routinely Perform Specific Tobacco Screening and Counseling Interventions, by Physician Sex, New York State, 1999*

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Female Physicians (n = 118)</th>
<th>Male Physicians (n = 253)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>For all adolescent patients</td>
<td>93</td>
<td>90</td>
<td>.05</td>
</tr>
<tr>
<td>Ask about smoking habits</td>
<td>24</td>
<td>36</td>
<td>.003</td>
</tr>
<tr>
<td>Ask about smokeless tobacco use</td>
<td>53</td>
<td>36</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Ask about friends’ smoking</td>
<td>62</td>
<td>54</td>
<td>.04</td>
</tr>
<tr>
<td>Discuss health risks of tobacco</td>
<td>79</td>
<td>76</td>
<td>.25</td>
</tr>
<tr>
<td>For nonsmoking patients</td>
<td>88</td>
<td>82</td>
<td>.02</td>
</tr>
<tr>
<td>Provide cessation handouts</td>
<td>82</td>
<td>81</td>
<td>.71</td>
</tr>
<tr>
<td>Help set a quit date</td>
<td>36</td>
<td>41</td>
<td>.16</td>
</tr>
<tr>
<td>Schedule follow-up for tobacco use</td>
<td>28</td>
<td>36</td>
<td>.02</td>
</tr>
</tbody>
</table>

* Data are given as the mean percentage of adolescent patients unless otherwise indicated.

### Table 3. Physicians Who Report Having Read All or Most of Adolescent Health and Tobacco Intervention Guidelines, by Specialty, New York State, 1999*

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Pediatricians (n = 192)</th>
<th>Family Physicians (n = 253)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAP’s Guidelines for Child Health Supervision II</td>
<td>86</td>
<td>22</td>
</tr>
<tr>
<td>AMA’s Guidelines for Adolescent Preventive Services</td>
<td>60</td>
<td>39</td>
</tr>
<tr>
<td>MCHB’s Bright Futures guidelines</td>
<td>35</td>
<td>3</td>
</tr>
<tr>
<td>AAFP’s age charts for periodic health examinations</td>
<td>28</td>
<td>79</td>
</tr>
<tr>
<td>NCI’s physician guide to smoking cessation</td>
<td>27</td>
<td>48</td>
</tr>
<tr>
<td>US Preventive Services Task Force’s Guide to Clinical Preventive Services</td>
<td>16</td>
<td>43</td>
</tr>
<tr>
<td>US Public Health Service’s Put Prevention Into Practice campaign</td>
<td>8</td>
<td>25</td>
</tr>
</tbody>
</table>

* Data are given as the percentage of physicians. All differences between pediatricians and family physicians are significant (P < .001). AAP indicates American Academy of Pediatrics; AMA, American Medical Association; MCHB, Maternal and Child Health Bureau; AAFP, American Academy of Family Physicians; and NCI, National Cancer Institute.
suling interventions, was 56.0, and the mean was 56.4 (SD, 17.6), for all respondents. Family physicians scored higher on this performance index than did pediatrics (61 vs 53; \( P < .001 \)). Overall performance between male and female physicians was not significantly different (56 vs 57; \( P = .50 \)).

Differences in physicians’ other usual care practices provided during preventive visits with 15- to 18-year-old patients also varied by specialty, sex, and geographic area. Pediatricians reported spending more time than family physicians with their most recent adolescent patient seen for a well-care visit (26 vs 21 minutes; \( P < .001 \)). In addition, pediatricians had more well-care visits that included at least some time alone with the adolescent than did family physicians (84% vs 73% of visits; \( P < .001 \)). Female physicians reported spending more time with the last adolescent patient they had seen for a well-care visit (26 vs 21 minutes; \( P < .001 \)) and more time alone with adolescent patients (85% vs 76% of visits; \( P < .001 \)) than did their male colleagues. When compared by metropolitan statistical area, physicians from Rochester devoted more time to adolescent well-care visits than did physicians from Buffalo and Syracuse (25 vs 23 and 21 minutes; \( P = .02 \)). Screening questionnaires were used by more pediatricians than family physicians (34% vs 14%; \( P < .001 \)) and by more physicians in Syracuse than in Buffalo and Rochester (31% vs 27% and 17%; \( P = .04 \)).

Using multiple linear regression with the performance index as the dependent variable, we examined the independent effects of demographic factors (physician specialty, sex, city, and year of graduation; percentage of adolescent visits devoted to preventive care; and familiarity with different practice guidelines) and practice factors (use of a screening questionnaire; the percentage of well-care visits that include time spent alone with the adolescent; and the time spent with the most recent adolescent patient seen for a well-care visit) associated with screening and counseling practices (Table 4). We evaluated first-degree interactions among all of the significant independent variables from the full model (none were significant) and retained significantly associated variables in a final model. In this model, familiarity with the NCI’s guidelines, the amount of time spent during the most recent adolescent well-care visit, being a family physician, familiarity with the American Academy of Pediatrics’ Guidelines for Child Health Supervision II, and the percentage of well-care visits that included time spent alone with the adolescent were significantly associated with overall performance of comprehensive tobacco interventions (\( P < .001 \)).

Many of the physicians in our study reported asking adolescents if they smoke cigarettes. This finding is consistent with previous studies15-24 of tobacco screening and counseling practices of primary care physicians. However, these physicians perform many other recommended adolescent tobacco interventions at relatively low rates. Multiple guidelines recommend specific techniques for screening and counseling for tobacco use. Nevertheless, the physicians in our study screen less than half of adolescent patients for smokeless tobacco or peer tobacco use, despite evidence that smokeless tobacco use is increasing25 and that peer influence is a factor in the initiation of youth smoking behavior.26

Adolescent tobacco cessation counseling interventions are performed at even lower rates than are screening practices. Despite evidence supporting the use of specific counseling strategies to improve quit rates in adults, and explicit guidelines that suggest strategies for use with adolescents, with the exception of assessing motivation to quit, the physicians in our study seldom used these interventions with adolescent patients. Others18,22 have also shown that cessation counseling and anticipatory guidance are performed at lower rates for youth than for adults. In our study, asking for a quit date and planning for follow-up visits, smoking cessation interventions that require active participation by clinicians and adolescents, were performed at the lowest rates.
The family physicians in our study reported performing recommended smoking cessation counseling interventions at higher rates than pediatricians, and this variation by specialty remained when the analysis was controlled for physician sex and geographic area. A recent study of California physicians also found that family physicians reported screening more of their patients for cigarette use than did pediatricians; specialty differences in beliefs about patient compliance and level of comfort in dealing with adolescent patients were thought to explain these differences in screening behaviors. Better self-reported performance among family physicians may also be attributable to greater familiarity with adult care and experience with adult smokers. Our study confirms these specialty differences in screening performance. However, for cessation counseling performance, we found that neither pediatricians nor family physicians were likely to deliver guideline-based preventive interventions. Nevertheless, we are able to examine some of the factors other than specialty that influence physicians’ practices.

Of the preventive service guidelines we asked about, the NCI’s recommendations are the only ones that deal solely with tobacco use. In the other guidelines, tobacco prevention and cessation are one of a comprehensive set of recommended preventive services. Greater familiarity with the NCI’s guideline was highly associated with better overall performance of tobacco screening and counseling interventions, but this familiarity only partially explained specialty differences. Whether this is because of the focused nature of the NCI’s recommendations, the type of educational exposures that led physicians to familiarity with the NCI’s materials, or other factors cannot be determined from this study. However, a recent study of Massachusetts’ pediatricians also found that previous training was associated with self-reported smoking counseling delivery.

Not surprisingly, we found specialty variation in physician familiarity with various preventive service guidelines. In addition to their own specialty organization’s recommendations, pediatricians had more familiarity with guidelines that target pediatric and adolescent populations. In contrast, family physicians were more familiar with guidelines that address all age groups. Familiarity with the American Academy of Pediatrics’ recommendations was associated with better adolescent smoking cessation counseling. However, when stratified by specialty, this association was only true for family physicians, perhaps reflecting that family physicians’ overall degree of attention to age- or specialty-specific practice guidelines may be an indicator for better service delivery across that age span, too.

Others have found higher rates of screening for regular smoking by female than male physicians during routine adolescent visits. Similarly, sex differences have been reported in how well reproductive health services are delivered to adults. However, when controlled for demographics and practice characteristics, we did not find physician sex to be associated with smoking screening and counseling behavior for the physicians in our study. Ellen et al asked their sample of California physicians only 2 questions about screening behaviors to determine rates of smoking interventions, so the different findings from our survey may be due to the greater detail obtained from our measure. Our findings are also more specific for actual performance of NCI guideline recommendations. Longer visits and spending time alone with the adolescent were associated with better performance of comprehensive tobacco interventions. These 2 factors are thought to enhance rapport and are necessary if confidential screening or counseling discussions are to take place. Since sex differences are modified by these practice factors, altering care practices, rather than relying on a fixed characteristic such as physician sex, may help all physicians improve tobacco screening and counseling behaviors.

Our results are limited by selection bias, as those physicians who provide more preventive care or who have more of an interest in adolescent care may have been more likely to respond to the survey. We are also limited by the validity of self-report, as physicians may overreport provision of preventive services if they know them to be recommended. Thus, it is likely that fewer patients actually received these interventions than the proportions reported by clinicians. We did not explore the proportion of adolescent patients seen by each clinician, differences by practice setting, or differences in clinician’s access to smoking cessation resources, and these factors, too, may have an influence on a physician’s prevention practices. In addition, the generalizability of this study is limited to pediatricians and family physicians in western New York, and may not fully represent other regions or other types of primary care clinicians.

Our study shows that there are still many opportunities for physicians to improve the delivery of tobacco interventions to their adolescent patients. In addition, our findings clearly demonstrate the substantial gap between publication and implementation of smoking cessation guidelines. In the past few years, Guidelines for Adolescent Preventive Services and Bright Futures recommendations for comprehensive adolescent preventive care have been developed, the Agency for Health Care Policy and Research issued guidelines, and the US Public Health Service issued smoking cessation guidelines that include recommendations for cessation for adolescents. While specific evidence for the effectiveness of counseling in adolescents remains elusive, our findings suggest that physicians’ limited adherence to recommended intervention strategies may be responsible for the lack of evidence for effective cessation counseling for adolescent smokers, rather than a lack of effectiveness of the interventions themselves. Documentation and sustained performance of these clinical interventions at high rates will be necessary to truly assess the effectiveness of either tobacco cessation practices or other preventive service guidelines.

Finally, our results suggest that implementation of preventive service recommendations may best be accomplished through dissemination of information through physician specialty organizations. While the cost of new preventive visits may be significant, the cost of improving the content of the care provided during encounters is relatively low. Additional research to determine how to best provide specific practice-oriented materials and facilitate adoption of preventive care delivery recom
mendations by primary care adolescent health clinicians is needed, if the goal of delivering smoking cessation counseling is to be achieved.

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