# Factors Associated with Physician Interventions to Address Adolescent Smoking

*Tammy H. Sims, John R. Meurer, Mario Sims, and Peter M. Layde*

**Objective.** To determine the percent of adolescent Medicaid patients with medical record documentation about tobacco use status and cessation assistance; and factors associated with providers documenting and intervening with adolescent smokers.

**Data Source.** Secondary analysis of data collected in 1999 from medical records of Wisconsin Medicaid health maintenance organization (HMO) recipients 11 to 21 years old.

**Study Design.** Random reviews and data collection were related to visits from January 1997 to January 1999. Data collected included patient demographics, provider type, number of visits, and whether smoking status and cessation interventions were documented.

**Data Extraction Methods.** Medical charts were reviewed and a database was created using a data abstraction tool developed and approved by a committee to address tobacco use in Medicaid managed care participants.

**Principal Findings.** Among adolescents seen by a physician from 1997 to 1999, tobacco use status was documented in 55 percent of patient charts. Most often tobacco use status was documented on history and physical or prenatal forms. Of identified adolescent smokers, 50 percent were advised to quit, 42 percent assisted, and 16 percent followed for smoking cessation. Pregnant patients were more likely to have tobacco use documented than nonpregnant patients (OR = 10.8, 95 percent CI = 4.9 to 24). The odds of documentation increased 21 percent for every one-year increase in patient age.

**Conclusions.** Providers miss opportunities to intervene with adolescents who may be using tobacco. Medical record prompts, similar to the tobacco use question on prenatal forms and the tobacco use vital sign stamp, are essential for reminding providers to consistently document and address tobacco use among adolescents.

**Key Words.** Adolescent, tobacco use, smoking, physician interventions

Tobacco use is the leading cause of death in the United States (Centers for Disease Control and Prevention 1990), and is viewed as a pediatric disease because it has been estimated that 80–90 percent of adult smokers began smoking before the ages of 18–19 years (U.S. Department of Health and Human Services 1994). Although the majority of adolescents who start smoking believe they will smoke for only a short time, at least half of them will

become addicted and will still be smoking five years later (U.S. Department of Health and Human Services 1994). In addition, *Healthy People 2010,* a comprehensive outline of the nation's agenda for health promotion and disease prevention, includes objectives for tobacco control and for reducing tobacco use by adolescents (U.S. Department of Health and Human Services).

Tobacco dependence is a chronic disease that requires repeated, systematic clinical interventions. A number of public health agencies are committed to helping health care providers identify and intervene with tobacco users to encourage cessation. In 1990, the National Cancer Institute developed an approach to addressing tobacco use called the 4 A's (ask, advise, assist, arrange follow-up) model. In 1996, the U.S. Public Health Service Agency for Health Care Policy and Research (AHCPR), now the Agency for Healthcare Research and Quality (AHRQ), introduced smoking cessation clinical practice guidelines to assist health care providers in identifying and intervening with smokers to encourage cessation (Fiore et al. 1996). In 2000, the U.S. Public Health Service (PHS) updated guideline, *Treating Tobacco Use and Dependence,* was published; it recommends the 5 A's model (ask, advise, assess, assist, arrange follow-up) for addressing tobacco use (Fiore et al. 2000). Since 1996 the guidelines have recommended the implementation of office-wide systems (such as a tobacco use vital sign stamp) to ensure that every patient at every visit has tobacco use status queried and documented. Also, it has been recommended that all smokers receive clear advice to quit and assistance with quitting, as well as arrangements for follow-up contact to address smoking cessation (Fiore et al. 1996, 2000). Moreover, provider reminders are included in the recommendations of the Task Force on Community Preventive Services as an intervention proven effective for

---

This work was presented in part at the 2001 Pediatric Academic Societies annual meeting in Baltimore, Maryland. We gratefully acknowledge the Wisconsin Medicaid Program and its chief medical officer, Dr. Richard M. Carr, who served as principal investigator of the Robert Wood Johnson Foundation grant no. 035848 titled "Addressing Tobacco in Managed Care Program." We also acknowledge and thank project director, Bruce Christiansen, Ph.D., for providing data for this study. Author Tammy Sims appreciates support from National Research Service Award grant (number 1T32PE10030-01) to the Medical College of Wisconsin.

Address correspondence to Tammy H. Sims, M.D., M.S., Assistant Professor of Pediatrics, Center for Tobacco Research and Intervention, University of Wisconsin Medical School, 1930 Monroe St., Madison, WI 53711. John R. Meurer, M.D., M.B.A., is an Associate Professor of Pediatrics, Center for the Advancement of Urban Children, Medical College of Wisconsin, Milwaukee. Mario Sims, Ph.D., is an Assistant Professor of Medicine, University of Mississippi Medical Center, Jackson Heart Study, Jackson, MS. Peter M. Layde, M.D., M.Sc., is a Professor of Family and Community Medicine, Medical College of Wisconsin, Milwaukee.

reducing tobacco use and exposure to environmental tobacco smoke (Task Force on Community Preventive Services 2001; Hopkins et al. 2001).

The current literature addressing the issue of physician interventions to treat tobacco use among adolescents is based largely on physician self-report. It indicates that though providers reportedly identify smokers, few provide some type of intervention to aid adolescent patients in cessation efforts, such as advising users to quit, assisting the user in quitting, and arranging follow-up for tobacco users (Thorndike et al. 1999; Goldstein et al. 1998; Zapka et al. 1999). The current study goes beyond physician self-report to provide information on physician intervention and documentation practices related to treating tobacco use and dependence among adolescent patients by examining medical records. Unlike previous studies, this analysis also focuses on a high-risk, low-income population: those enrolled in the government-funded Medicaid program. Studies have shown that those who have less education, are poor, unmarried, and unemployed are more likely to start smoking and less likely to quit (Berman et al. 1997). Given the disproportionate burden of tobacco-related illnesses that those from lower socioeconomic groups experience, and their more limited access to cessation services, it is important to determine what types of interventions are being offered to this high-risk population.

This research was designed to evaluate adoption of the 1996 AHCPR smoking cessation clinical practice guideline among primary care providers by determining for a cohort of adolescents the percentage for whom health care providers:

1. Document exposure to environmental tobacco smoke (passive smoking)
2. Document current smoking status of the patient, including a description of current smoking and a smoking history
3. Give advice about quitting smoking
4. Offer assistance with quitting
5. Arrange follow-up for those identified as smokers in the medical records, and
6. Link smoking status and/or exposure to the patient's other health conditions.

A secondary research objective, not addressed in previous studies, was to evaluate one type of system-level intervention recommended by the 1996 and 2000 PHS guidelines and the Task Force on Community Preventive Services. Specifically, we evaluated whether standardized chart reminders

prompted providers to document the smoking status. Finally, we determined the factors associated with physician documentation of adolescent tobacco use status, and with interventions being offered.

## METHODS

This analysis focused on individuals 11 to 21 years old, referred to here as adolescents, to determine if providers caring for adolescents give attention to tobacco use and dependence in the patient's medical records. This research was exempt by the Institutional Review Board because authors used a secondary dataset without patient identifiers. The Wisconsin Medicaid program created the secondary dataset by conducting a chart audit during which individual patient charts were randomly selected from Medicaid HMO eligibility files and reviewed to document the smoking cessation efforts of Wisconsin's Medicaid health maintenance organizations (HMOs) from January 1997 through January 1999. To ensure reliability, two trained reviewers conducted the chart audits in 1999 using a chart audit data abstraction tool developed and tested by investigators.

Sampling included patients 11 years and older and was stratified by the five Wisconsin geographic health regions. Of the 1,920 charts requested, 83 percent (1,597) were received and reviewed. Additional details of the sampling methodology are given elsewhere (Carr et al. 2001). A subsample of the reviewed charts (734), consisting of patients in the adolescent age range (11 through 21 years old), was used in analyses for the current study. The primary care medical charts included progress notes, history and physical forms, and other records. All progress notes covering a two-year period including assessment, plan of care, medications, nurses and other health care provider notes, patient teaching and education documentation, and referrals and consultation reports were reviewed. Forms reviewed regardless of date included registration information, initial history and physical reports, any flow sheet of health care or health status across time, including American College of Obstetrics and Gynecology (ACOG) prenatal forms or other prenatal forms, and any health questionnaires or history forms completed by the patient. Information abstracted for the dataset included: region of state, patient gender, patient age, type of provider, number of visits, documentation of smoking status, location of documentation in the medical record (including whether smoking status was highlighted as a "vital sign"), smoking history, type of advice and assistance offered to smokers, whether changes in smoking status

were noted, whether follow-up was arranged, and whether the chart included care during pregnancy. Race/ethnicity of patients was not collected for the dataset and therefore is not included in the analyses.

Statistical analyses included descriptive statistics, the chi-square test, and logistic regression analyses. Logistic regression analyses were conducted to determine factors associated with documentation of smoking status and implementation of interventions to promote and aid cessation attempts. The odds ratios and 95 percent confidence intervals for the variables in the model were calculated.

## RESULTS

The sample of patients included 68 percent females and 32 percent males. The majority of adolescent patients in this cohort were cared for by family practitioners (Table 1). Thirty-five percent of the adolescent females were cared for in the context of pregnancy. Obstetrician/gynecologists tended to take care of a greater number of older adolescents (defined here as 18 to 21 years old), whereas pediatricians tended to take care of a greater number of younger adolescents (defined here as less than 18 years old).

Tobacco use status was documented in 55 percent of patient charts. Of the patient charts with documentation of tobacco use status, 35 percent were current users of tobacco products, 8 percent were ex-users, and 57 percent were never users. Of the current users of tobacco products, 99.3 percent identified themselves as smokers, while only 0.7 percent were smokeless tobacco users. Most often tobacco use status was documented on the history and physical form, or on the ACOG or other prenatal form. Only 5 percent of patient charts had tobacco use documented as a vital sign in the portion of the chart with heart rate, respiratory rate, and temperature and blood pressure recordings as recommended by the 1996 and 2000 PHS guidelines. Approximately 18 percent of all adolescent patients were asked details about a smoking history, while 80 percent of identified ever-users of tobacco had a detailed history of tobacco use recorded in the medical record.

After controlling for patient age, there were no significant differences in documentation of patient tobacco use status by various primary care providers. All age-adjusted odds ratios for documentation of tobacco use status include 1 (Figure 1). Figure 2 indicates the interventions offered by various providers to adolescent patients identified as users of tobacco. The categories of advise, assist, and arrange are not mutually exclusive. Advised

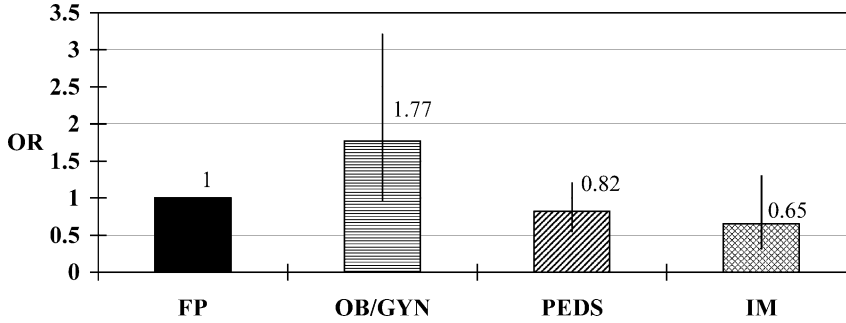
Table 1: Description of Patient Sample

| *Demographics* | *Number* | *Percentage (%)* |
|---|---|---|
| Gender | | |
| Male | 232 | 32 |
| Female | 502 | 68 |
| Total | *734* | *100* |
| Age (years) | | |
| 11 | 40 | 5 |
| 12 | 70 | 10 |
| 13 | 97 | 13 |
| 14 | 85 | 12 |
| 15 | 65 | 9 |
| 16 | 54 | 7 |
| 17 | 58 | 8 |
| 18 | 55 | 7 |
| 19 | 64 | 9 |
| 20 | 68 | 9 |
| 21 | 78 | 11 |
| Total | *734* | *100* |
| State Region | | |
| Rural | 463 | 63 |
| Urban/suburban | 271 | 37 |
| Total | *734* | *100* |
| Provider type | | |
| Family practitioner | 366 | 50 |
| Pediatrician | 203 | 28 |
| Obstetrician/gynecologist | 123 | 17 |
| Internist | 42 | 5 |
| Total | *734* | *100* |

means that the patient was told about the health hazards of tobacco use and encouraged to discontinue use. Assisted means that the patient received more than advice to quit, such as help with setting a quit date, a referral for structured cessation counseling, self-help materials or a prescription for medications to aid cessation. Also, the physician may have provided more extensive counseling by discussing reasons to quit, strategies to use for quitting, and refusal skills. Arranged means that the patient was scheduled for follow-up visits to further address tobacco use, or had subsequent visits noted in which tobacco use status was reexamined. All types of providers tended to advise users to quit more often than providing assistance and follow-up for users.

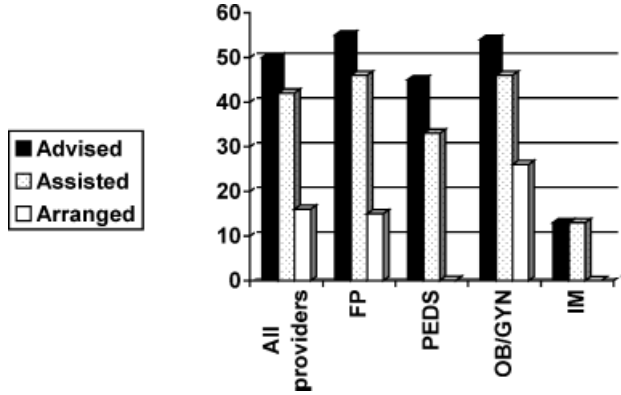
Fifty percent of those identified as tobacco users had documentation of advice by their primary care physician to quit using tobacco. However, only 12 percent of all adolescents had medical record documentation of being advised

Figure 1: Age-Adjusted Odds of Documenting Tobacco Use Status




FP = family practitioner, OB/GYN = obstetrician/gynecologist, PEDS = pediatrician, IM = internist, OR = odds ratio; confidence intervals expressed by bar lines.

Figure 2: Physician Interventions Offered to Patients Using Tobacco




*Note*: Advised, assisted, arranged interventions defined in text.

by providers regarding use of tobacco products. Forty-two percent of identified adolescent tobacco users were offered assistance. Counseling was the most common form of quitting assistance offered to adolescents. No prescriptions for nicotine replacement therapy were documented. However, at the time of this study nicotine patch and gum were available over the counter, though not for sale to those under the age of 18 years. Of the 171 identified tobacco users, only 16 percent had follow-up arranged. However, 39 percent of identified tobacco users who were offered assistance had follow-up arranged.

Only 5 percent of patient charts had documentation regarding exposure to passive or environmental tobacco smoke. Though the majority of patients (87 percent) had more than one visit within the two-year period, and 63 percent had three or more visits, only 25 percent of patient charts had an indication that tobacco use was addressed on more than one occasion, making it unlikely that most providers would identify early experimenters. For 44 percent of the adolescent patients who were identified as current or ex-users of tobacco, a primary care provider linked their tobacco use to other health conditions or a particular illness.

Pregnancy status was significantly associated with documentation of tobacco use status, after controlling for provider type, region of the state, age, gender, and number of visits. (Table 2). If care occurred in the context of

Table 2: Logistic Regression Analyses of Factors Associated with Documentation of Tobacco Use Status

| *Predictors* | *Documentation of Tobacco Use Status Adjusted OR (95% CI)* | *Documentation of Passive Smoke Exposure Adjusted OR (95% CI)* | *Documentation of Tobacco Use History Adjusted OR (95% CI)* |
|---|---|---|---|
| Patient gender | | | |
| Male | 1.00 | 1.00 | 1.00 |
| Female | 1.21 (0.83–1.77) | 1.42 (0.61–3.34) | 1.19 (0.82–1.74) |
| Patient age* | | | |
| (11–21 yrs) | **1.21 (1.13–1.31)** | 0.92 (0.78–1.08) | **1.13 (1.06–1.22)** |
| Region | | | |
| Rural | 1.00 | 1.00 | 1.00 |
| Urban/Suburban | **1.95 (1.36–2.81)** | 1.75 (0.89–3.46) | **1.91 (1.34–2.71)** |
| Provider type | | | |
| FP | 1.00 | 1.00 | 1.00 |
| IM | 0.77 (0.37–1.62) | † | 0.90 (0.44–1.85) |
| PEDS | 0.81 (0.54–1.21) | 0.93 (0.41–2.15) | 0.88 (0.59–1.32) |
| OB/GYN | 0.74 (0.37–1.51) | **0.06 (0.01–0.43)** | 0.99 (0.53–1.85) |
| Care during pregnancy | | | |
| No | 1.00 | 1.00 | 1.00 |
| Yes | **9.80 (4.39–21.90)** | **4.03 (1.33–12.25)** | **6.83 (3.63–12.85)** |
| Number of visits | | | |
| $<3$ | 1.00 | 1.00 | 1.00 |
| $\geq 3$ | **1.82 (1.22–2.69)** | 1.81 (0.67–4.92) | **1.84 (1.24–2.74)** |

*Note*: Bold letters indicate statistically significant factors (those having confidence intervals that do not include 1.0).

OR = odds ratio adjusted for all variables in the table; CI = confidence interval.

*Per year increase in age.

†No internist documented passive smoke exposure.

pregnancy, patient charts had a 9.8 times (95 percent CI 4.39–22) greater odds of having tobacco use status documented than if care did not occur in the context of pregnancy. Age was significantly associated with documentation of tobacco use status, after controlling for provider type, region of the state, gender, number of visits, and whether care occurred in the context of pregnancy. Older adolescents were more likely than younger adolescents to have tobacco use status documented by a primary care provider. The odds of having tobacco use status documented increased by 21 percent for every one-year increase in the patient's age.

Very few patient charts had any documentation of environmental tobacco smoke exposure or passive smoke. However, passive smoking status was 4 times more likely to be documented in the context of pregnancy than in nonpregnant patients. In the multivariate model to determine variables associated with whether a history of tobacco use was documented, region of the state, care occurring in the context of pregnancy, number of visits, and patient age were significantly associated. Patients in an urban/suburban region had a 1.9 times greater odds of having a history of tobacco use documented in the medical record than those in rural regions. Also, the odds of having a tobacco use history documented in the medical record increased 13 percent for every one-year increase in patient age (Table 2).

In the multivariate model to determine variables associated with whether or not smoking is linked to other health conditions (e.g., asthma, diabetes, sinusitis) in the medical record, internal medicine provider type, region of the state, pregnancy status, number of visits, and age were all independently associated with the outcome variable (Table 3). When compared with family practitioners, patients seen by internists had a 0.29 odds of having tobacco use linked with other health conditions in the medical record. Patients seen by providers in urban/suburban regions were approximately 2.4 times more likely to have their other health conditions linked to smoking status than the patients seen by providers in rural regions. Pregnant patients were 6.1 times more likely than nonpregnant patients to have tobacco use status linked to other health conditions. Those with three or more health care visits were 1.6 times more likely to have their other health conditions linked to smoking status by providers. Finally, the likelihood of having tobacco use status linked to other health conditions by a primary care provider increased by 8 percent for each year increase in patient age (Table 3).

Internal medicine provider type, state region, pregnancy status, and number of visits were all associated with being advised to discontinue tobacco use, and receiving assistance with quitting, and having follow-up arranged by a

Table 3: Logistic Regression Analyses of Factors Associated with Interventions Offered Tobacco Users

| *Predictors* | *Health Status Linked to Tobacco Use Adjusted Odds Ratio (95% CI)* | *Advised to Quit Adjusted Odds Ratio (95% CI)* | *Assistance Offered with Quitting Adjusted Odds Ratio (95% CI)* | *Arranged Follow-up with Tobacco Users Adjusted Odds Ratio (95% CI)* |
|---|---|---|---|---|
| Patient gender | | | | |
| Male | 1.00 | 1.00 | 1.00 | 1.00 |
| Female | 1.10 (0.74–1.62) | 1.26 (0.85–1.86) | 1.24 (0.84–1.84) | 1.07 (0.72–1.59) |
| Patient age* | | | | |
| (11–21 yrs) | **1.08 (1.01–1.16)** | **1.08 (1.01–1.16)** | 1.07 (1.00–1.15) | 1.04 (0.97–1.12) |
| Region | | | | |
| Rural | 1.00 | 1.00 | 1.00 | 1.00 |
| Urban/Suburban | **2.45 (1.73–3.47)** | **2.59 (1.83–3.66)** | **2.26 (1.61–3.17)** | **2.34 (1.68–3.26)** |
| Provider type | | | | |
| FP | 1.00 | 1.00 | 1.00 | 1.00 |
| IM | **0.29 (0.12–0.69)** | **0.28 (0.12–0.65)** | **0.33 (0.14–0.76)** | **0.41 (0.18–0.95)** |
| PEDS | 0.87 (0.58–1.31) | 0.86 (0.57–1.28) | 0.89 (0.60–1.34) | 0.99 (0.66–1.49) |
| OB/GYN | 0.74 (0.42–1.30) | 0.93 (0.53–1.62) | 1.13 (0.67–1.92) | **1.67 (1.02–2.75)** |
| Care during pregnancy | | | | |
| No | 1.00 | 1.00 | 1.00 | 1.00 |
| Yes | **6.11 (3.50–10.65)** | **4.45 (2.58–7.67)** | **3.06 (1.83–5.13)** | **2.11 (1.28–3.47)** |
| Number of visits | | | | |
| $<3$ | 1.00 | 1.00 | 1.00 | 1.00 |
| $\geq 3$ | **1.57 (1.05–2.37)** | **1.71 (1.14–2.57)** | **1.77 (1.18–2.66)** | **1.52 (1.01–2.29)** |

*Note:* Bold letters indicate statistically significant factors (those having confidence intervals that do not include 1.0).

OR = odds ratio adjusted for all variables in the table; CI = confidence interval.

*Per year increase in age.

primary care provider. Age was associated with being advised to discontinue tobacco use, but not with receiving quitting assistance nor with having follow-up arranged by a primary care provider (Table 3).

## DISCUSSION

Our study includes information collected from visits over a two-year period. Since most adolescents (87 percent) had more than one clinic visit during this period, the findings indicate multiple missed opportunities for physicians to provide smoking cessation services to patients. Based on a chart audit, physicians asked about and documented the tobacco use status of about half of their adolescent patients. Even fewer were advised, assisted, and followed up. Pregnant patients and older patients were more likely to have tobacco use status documented, and to receive interventions to promote smoking cessation.

Only 5 percent of patient charts had tobacco use documented as a "vital sign" or similar flag, a recommendation of tobacco cessation experts, the Task Force on Community Preventive Services, and the 1996 and 2000 PHS clinical practice guidelines. Rather, the most common places in the chart for documentation of tobacco use were history and physical forms and ACOG prenatal forms. Specific questions about tobacco use on the ACOG prenatal forms served as prompts to remind providers to address the issue with patients. Patients seen in the context of pregnancy were more likely to have a detailed history of smoking documented in addition to basic smoking status, indicating that reminder systems prompt providers to address tobacco use.

Results of this current study based on chart documentation do not reflect the high rates of identification of smoking status reported in other studies of adolescents that relied on physician self-reports. Thorndike et al. (1999) examined rates of U.S. physicians identifying adolescents' smoking status and counseling adolescents about smoking using the National Ambulatory Medical Care Surveys from 1991 through 1996, and reflects information from a single visit. They found that physicians reported identifying adolescent's smoking status at 72 percent of visits, compared to documentation noted in 55 percent of the charts we examined.

Goldstein et al. (1998) analyzed self-administered surveys collected from a sample of community-based primary care physicians to evaluate a strategy for disseminating smoking cessation interventions to adult patients based in part on the National Cancer Institute 4 A's model. According to Goldstein

et al., 67 percent of community-based primary care physicians reported that they asked, and 74 percent reported that they advised their patients about smoking. Thirty-five percent of community primary care physicians assisted and 8 percent arranged follow-up for those patients who were identified as smokers. These researchers also found that after controlling for other variables, physicians in HMO settings were less likely than those in private offices to be active with smoking cessation counseling. However, this study focused primarily on adult patients, was completed before the availability of the nicotine transdermal patch, and before the introduction of Agency for Health Care Policy and Research (AHCPR) or PHS-based smoking cessation clinical practice guidelines (Fiore et al. 2000, 1996).

Our study provides information about how tobacco use was addressed, documented, and treated by physicians caring for adolescent patients. We found that interventions were offered to identified smokers at higher rates than described in the other studies. Zapka et al. (Zapka et al. 1999) studied pediatricians' self-reported intervention practices related to tobacco use and cessation for children/adolescents and parents using mailed anonymous surveys in 1995 through 1996. They found that pediatricians reported a greater tendency to counsel children and adolescents to not start smoking, but were less likely to counsel children/adolescents and parents who smoke to stop. Thorndike et al. determined that interventions were offered to less than 20 percent of identified adolescent smokers (1999). One explanation for different findings is that our study covered the time period after the introduction of the ACHPR smoking cessation clinical practice guideline (Fiore et al. 1996), whereas Thorndike's and Zapka's studies focused on the period before the guideline was published. The smoking cessation clinical practice guideline may have had a positive impact on physician practice patterns. Another explanation is that perhaps our study includes a larger percent of older adolescents, who are more likely to receive interventions for smoking cessation.

Studies have shown that physicians are more likely to address smoking at visits by patients, including adolescents, in the context of pregnancy (Thorndike et al. 1999). In the current study, physicians were more likely to address smoking in pregnant patients than in nonpregnant patients. Because pregnancy is a vulnerable state, providers may be more likely to address tobacco use in this situation. In addition, pregnancy during adolescence may be an indication of high-risk behavior, which may prompt providers to consider addressing all types of high-risk behaviors including smoking. Also, pregnant adolescents are more likely to be older adolescents, and therefore

more likely to receive smoking related counseling. However, even after controlling for age, pregnancy status was significantly associated with receipt of smoking-related counseling. Finally, because the ACOG and other prenatal forms represent the standard of care in the practice of obstetrics, and include an area for documentation of tobacco use status, providers are more likely to address the issue and document their efforts. The ACOG prenatal form represents a reminder system that prompts providers to address and document tobacco use in the patients' medical record.

One limitation of this research is that a gap exists between what a physician discusses during an office visit and what is written or recorded in the medical record of the patient. Frankowski et al. (Frankowski, Weaver, and Secker-Walker 1993) demonstrated that although 40 percent of pediatricians reported that they gathered a smoking history from parents, only 11 percent recorded the information in the charts of their pediatric patients. However, proper documentation is vital for reimbursement of services by third-party payers as well as for quality control and medico-legal reasons. Thus, this limitation does not diminish the importance of this research for determining the documentation and intervention practices of providers in terms of identifying and treating tobacco users. A recommended strategy for the primary care clinician is to "implement an office-wide system that ensures that for EVERY patient at EVERY visit, tobacco-use status is queried and documented" (Fiore et al. 1996). The most recent PHS clinical practice guideline states, "the consistent identification, documentation, and treatment of every tobacco user seen in a health care setting should be institutionalized by clinicians and health care delivery systems" (Fiore et al. 2000).

Another potential limitation is grouping pregnant adolescents with all other adolescents because pregnancy may be viewed as a chronic condition with a standard management protocol that includes addressing tobacco use. However, when the data were analyzed separately for nonpregnant adolescents, urban region, age, and the number of patient visits were significantly associated with the outcome variables. Therefore, the results for only nonpregnant adolescents were comparable to results for the entire sample.

This research illustrates that primary care providers missed opportunities to identify and document tobacco use among adolescents enrolled in Medicaid managed care. This suggests that systems were not in place to promote the consistent screening and treatment of adolescents who might be using tobacco. Perhaps adolescent tobacco use screening and smoking cessation assistance for adolescents should be included as a standardized performance measure for managed health care plans. Also, a tobacco use

"vital sign" stamp in pediatric charts on progress note forms as well as on health maintenance forms might serve as a cue to action similar to the ACOG form used by obstetricians and gynecologists. Providers caring for children should discuss and advise about tobacco use at every visit. All smokers, including adolescents, should be systematically identified, advised about the hazards of smoking, and encouraged to quit. They should be assessed for willingness to quit, assisted with their quit attempts, and scheduled for follow-up assessment of their quit efforts.

## REFERENCES

Berman, B. A., A. K. Yancey, R. Bastani, S. C. Grosser, A. Staveren, R. A. Williams, and D. Lee. 1997. "African-American Physicians and Smoking Cessation Counseling." *Journal of the National Medical Association* 89 (8): 534–42.

Carr, R. M., B. Christiansen, L. Jehn, and D. Matitz. 2001. "Meeting the Challenge of Tobacco Use within the Medicaid Population." *Wisconsin Medical Journal* 100 (3): 59–66.

Centers for Disease Control and Prevention. 1993. "Cigarette Smoking Attributable Mortality and Years of Potential Life Lost—United States, 1990." *Morbidity and Mortality Weekly Report* 42 (33): 64–9.

Fiore, M. C., W. C. Bailey, S. J. Cohen, S. F. Dorfman, M. G. Goldstein, E. R. Gritz, R. B. Heyman, J. Holbrook, C. R. Jaen, T. E. Kottke, H. A. Lando, R. E. Mecklenburg, P. D. Mullen, L. M. Nett, L. Robinson, M. L. Stitzer, A. C. Tommasello, L. Villejo, and M. E. Wewers. 1996. *Smoking Cessation Clinical Practice Guideline No. 18.* Agency for Health Care Policy and Research publication no. 96-0692. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service.

———. 2000. *Treating Tobacco Use and Dependence.* Clinical Practice Guideline. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service.

Frankowski, B., S. Weaver, and R. Secker-Walker. 1993. "Advising Parents to Stop Smoking: Pediatricians' and Parents' Attitudes." *Pediatrics* 91 (2): 296–300.

Goldstein, M. G., J. D. DePue, A. D. Monroe, C. W. Lessne, W. Rakowski, A. Prokhorov, et al. 1998. "A Population-Based Survey of Physician Smoking Cessation Counseling Practices." *Preventive Medicine* 27 (5, part 1): 720–9.

Hopkins, D. P., P. A. Briss, C. J. Ricard, C. G. Husten, V. G. Carande-Kulis, J. E. Fielding, M. O. Alao, J. W. McKenna, D. J. Sharp, J. R. Harris, T. A. Woollery, and K. W. Harris (Task Force on Community Preventive Services). 2001. "Reviews of Evidence Regarding Interventions to Reduce Tobacco Use and Exposure to Environmental Tobacco Smoke." *American Journal of Preventive Medicine* 20 (2S): 16–66.

Task Force on Community Preventive Services. 2001. "Recommendations Regarding Interventions to Reduce Tobacco Use and Exposure to Environmental Tobacco Smoke." *American Journal of Preventive Medicine* 20 (2S): 10–15.

Thorndike, A. N., T. G. Ferris, R. S. Stafford, and N. A. Rigotti. 1999. "Rates of U.S. Physicians Counseling Adolescents about Smoking." *Journal of the National Cancer Institute* 91 (21): 1857–62.

U.S. Department of Health and Human Services. 2000. *Healthy People 2010* (conference ed., 2 vols.). Washington, DC: U.S. Department of Health and Human Services.

———. 1994. *Preventing Tobacco Use among Young People: A Report of the Surgeon General.* Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

Zapka, J. G., K. Flethcher, L. Pbert, S. K. Druker, J. K. Ockene, and L. Chen. 1999. "The Perceptions and Practices of Pediatricians: Tobacco Intervention." *Pediatrics* 103 (5): e65.