# Tobacco Counseling at Well-Child and Tobacco-Influenced Illness Visits: Opportunities for Improvement

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**ABSTRACT.** *Objective.* **To assess the frequency of clinician-reported delivery of counseling for avoidance of child environmental tobacco smoke (ETS) exposure and tobacco use at periodic well-child visits and at illness visits for asthma and otitis media (OM).**

*Methods.* **Combined data from the National Ambulatory Medical Care Survey and the outpatient portion of the National Hospital Ambulatory Medical Care Survey from 1997 to 1999 were analyzed. The frequency of pediatric visits (≤18 years) that included clinician-reported counseling for tobacco use/exposure prevention was assessed. Diagnosis-specific visits were determined by using *International Classification of Diseases, Ninth Revision* codes for asthma (493-), OM (381-, 382-), and well-child visits. Bivariate and regression analyses were performed.**

*Results.* **Of 33 823 ambulatory care visits by children, 1.5% were reported to include delivery of tobacco counseling. Only 4.1% of well-child visits, 4.4% of illness visits for asthma, and 0.3% of illness visits for OM included tobacco counseling. With the use of logistic regression models, adolescent patient visits (13–18 years) were more likely to include delivery of tobacco counseling than younger child visits [OR = 15.8, 95% CI (7.5–33.5)]. Visits by children with Medicaid and those seen by a nurse practitioner or a physician's assistant were also more likely to include tobacco counseling (odds ratio: 1.6; 95% confidence interval: 1.002–2.50; and odds ratio: 3.0; 95% confidence interval: 1.5–6.0, respectively). There were no significant differences in counseling delivery by race, ethnicity, or clinician specialty.**

*Conclusions.* **Rates of tobacco counseling at well-child visits and at illness visits for diagnoses directly affected by tobacco use and ETS are extremely low. Significant opportunities exist to improve counseling rates for child ETS exposure and adolescent tobacco use in primary care.** *Pediatrics* **2003;111:e162–e167. URL: http://www.pediatrics.org/cgi/content/full/111/2/e162;** ***environmental tobacco smoke, smoking, tobacco use, counseling, parental smoking, second-hand smoke, pediatrics, asthma, otitis media.***

ABBREVIATIONS. ETS, environmental tobacco smoke; OM, otitis media; SIDS, sudden infant death syndrome; NHAMCS, National Hospital Ambulatory Care Survey; NAMCS, National Ambulatory Medical Care Survey; OR, odds ratio; CI, confidence interval.

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Environmental tobacco smoke (ETS) is a major preventable environmental cause of morbidity and mortality in the United States. ETS has been linked to numerous adverse health outcomes, including lung cancer, asthma, respiratory infections, otitis media (OM), low birth weight, and sudden infant death syndrome (SIDS).[1–4] In addition, children and adolescents who are exposed to smokers in their household are 3 times more likely to initiate smoking themselves.[5] Approximately 23.5% of US adults[6] and an alarming 28.5% of high school students are current smokers.[7] Data from the National Health and Nutrition Examination Survey III indicate that as many as 43% of US children,[8] >15 million,[9] are exposed to ETS by household members. In addition, 12.3% of women who gave birth in the United States in 1999 smoked during pregnancy.[10] The direct cost of children's medical care attributable to ETS was approximately $1.97 billion in 1997.[11]

Given the burden of ETS, there is an imperative to intervene to limit such exposure for the improved health and well-being of both children and adults. Well-child and illness-related visits are important opportunities for intervention because parents of young children visit pediatricians and family practitioners frequently.[12] The American Academy of Pediatrics[13,14] and the American Academy of Family Physicians[15] advise parents to limit children's ETS exposure. In addition, surveys have demonstrated that 79% to 93%[16,17] of smoking parents agree that it is appropriate for their child's pediatrician to provide smoking cessation advice, and 48% to 56% of parents believe that it is a pediatrician's job to advise smoking parents to quit.[12,16]

Physician and other clinician counseling interventions for parental smoking cessation and reduction of children's exposure to ETS have been shown to have some effect. Observed positive effects have included a decrease in the reported number of cigarettes to which children were exposed in the home,[18–21] decreases in levels of nicotine measured in the home,[22] increase in parent-reported smoke-free households, and increased parent quit rates.[23] Most of these studies have specifically targeted parents of children with asthma.

Despite the benefits of counseling interventions and the known adverse ETS effects on illnesses such

as OM and asthma, many physicians do not deliver smoking cessation counseling to pediatric patients and their parents.[24] Several regional studies to date that have assessed attitudes and self-reported practice of tobacco use and cessation screening and interventions have found widely varying rates of counseling and intervention. In 2 studies that assessed counseling of adolescent patients, physicians reported screening 71.4% of younger adolescents and 84.8% of older adolescents about tobacco use in a California survey[25] and 91% of adolescents in an upstate New York survey.[26] In a study of Connecticut physicians and dentists, 65% of practitioners reported "frequently" or "always" counseling patients about tobacco between ages 16 and 18, 54% between ages 13 and 15, and 38% between ages 10 and 12.[27] With respect to parent counseling, a study in Vermont found that 94% of pediatricians surveyed reported that they advised at least 60% of their smoking parents to quit,[12] and a similar study in Maine found that 91% of pediatricians reported that they advised their smoking parents to quit.[28] There is little information on practices at the national level, but 1 study found that only 15% of general pediatricians reported offering specific assistance to parents for smoking cessation and 85% offered only nonspecific advice.[29]

This study presents data from a national sample of clinicians who provide medical care to children on the frequency of their reported tobacco counseling. This information was recorded after individual visits and reported in the National Hospital Ambulatory Care Survey (NHAMCS) and National Ambulatory Medical Care Survey (NAMCS) from 1997 to 1999.

## METHODS

The NAMCS and NHAMCS are part of the ambulatory portion of the National Health Care Survey administered by the National Center for Health Statistics to measure health care utilization. The NAMCS is an ongoing survey (from 1972) of US office-based physicians, and NHAMCS is a similar ongoing survey (from 1992) of hospital outpatient and emergency departments. For this study, emergency department visits were excluded. The NAMCS includes visits made in the United States to the offices of non–federally employed physicians classified as "office-based, patient care" by the American Medical Association and/or the American Osteopathic Association. Visits to private, non–hospital-based clinics and health maintenance organizations were included in NAMCS, whereas visits to federally operated facilities and hospital-based outpatient departments were not. NHAMCS includes in-person visits made in the United States to outpatient departments of non-federal, short-stay hospitals.

Participating physicians and other clinicians in their offices complete a 1-page patient record form for a systematic random sample of ambulatory care visits during a randomly assigned week. Clinicians record demographic information, expected source of payment, reason for visit, diagnoses, diagnostic and screening procedures, patient management, counseling and education provided, and medications prescribed (including immunizations). For the NHAMCS, characteristics of the hospital are also collected. Within the same years of the survey, NAMCS and Outpatient NHAMCS participants completed identical encounter forms. There were minor additions to the forms between the 1998 and 1999 editions, but these added questions were not included in the current analyses.

Data from the 1997, 1998, and 1999 NAMCS and NHAMCS were combined for these analyses. Data from both NAMCS and NHAMCS were included to capture a broader number and range of patients, as hospital ambulatory patients frequently differ from office patients in their demographic and medical characteristics.[30] Combining data sets also provided information on a significant number of children missed by using NAMCS alone: in 1997, 77.1% of ambulatory medical visits of children aged 15 and younger occurred in office-based practices, and 10.3% occurred in hospital outpatient departments.[30] Although these survey instruments do not capture the type or quality of counseling intervention, they do demonstrate simple frequencies of clinician-reported counseling at the time of visit.

For this study, all patients who were older than 18 years (in both NAMCS and NHAMCS) were excluded, as were emergency visits from NHAMCS. In addition, visits at which patients were seen only by registered nurses, licensed practical nurses, nurse midwives, or medical or nursing assistants were excluded. All percentages in this study are weighted to reflect national estimates. Independent predictors of tobacco counseling were determined with weighted logistic regression. Asthma and OM were used as predictor variables on the basis of their well-established association with environmental smoke exposure. Diagnoses for asthma and OM were based on *International Classification of Diseases, Ninth Revision* codes of asthma (493-) and OM (381-, 382-). Covariates were visit diagnosis (well-child visit, asthma, or OM), patient demographics (age, gender, race, and ethnicity), expected payment source for the visit, type of clinician seen (physician or midlevel practitioner), and physician specialty. Source of payment was divided into 4 categories: private, Medicaid, self-pay, or other. Physician specialty was categorized as general/family practice, pediatrics, or all other. SUDAAN software[31] was used to account for the complex sample design.

## RESULTS

Data were available for 33 823 child and adolescent (≤18 years) patient visits for well-child and illness/injury care. Of these visits, only 520 included tobacco counseling as reported by the clinician on the patient record form. Table 1 shows the prevalence of tobacco counseling in the ambulatory setting, with an overall rate of tobacco counseling at 1.5% of all

**TABLE 1.** Prevalence of Tobacco Counseling at Medical Visits for Children Younger Than 18 Years

| | *N* | % Visits | *P* Value |
|---|---|---|---|
| Overall | 33 823 | 1.5 | |
| Age | | | <.001 |
| 0–1 y | 8834 | 0.7 | |
| 2–4 y | 5593 | 0.6 | |
| 5–12 y | 10 915 | 1.2 | |
| 13–18 y | 8481 | 3.5 | |
| Race | | | .61 |
| White | 25 311 | 1.5 | |
| Black | 7134 | 1.7 | |
| Other | 1378 | 1.7 | |
| Ethnicity | | | .49 |
| Non-Hispanic | 21 749 | 1.7 | |
| Hispanic | 5443 | 1.3 | |
| Insurance | | | .04 |
| Private | 15 780 | 1.4 | |
| Medicaid | 11 590 | 1.9 | |
| Other | 2405 | 2.3 | |
| Self-pay | 2943 | 0.7 | |
| Visit diagnosis | | | <.001 |
| Well-child care | 5357 | 4.1 | |
| Asthma | 1228 | 4.4 | |
| OM | 3080 | 0.3 | |
| Both asthma and OM | 94 | 0.5 | |
| All other diagnoses | 24 064 | 0.9 | |
| Clinician type | | | .04 |
| Physician | 31 284 | 1.5 | |
| Midlevel practitioner (NP, PA) | 2132 | 4.1 | |
| Physician specialty | | | .03 |
| General/family practice | 9586 | 1.9 | |
| Pediatrician | 15 935 | 1.6 | |
| All other | 8302 | 0.9 | |

NP indicates nurse practitioner; PA, physician's assistant.

visits. There was a greater prevalence of counseling with increasing patient age at visits for any diagnosis, with 0.7% of 0- to 1-year-olds receiving counseling compared with 3.5% of 13- to 18-year-olds. Visits for well-child care included counseling 4.1% of the time; with 0- to 1-year-olds receiving counseling at 1.4% of visits, 2- to 4-year-olds at 2.2% of visits, 5- to 12-year-olds at 6.13% of visits, and 13- to 18-year-olds at 12.1% of visits (Table 2). The difference in prevalence rates at well-child visits by age was statistically significant ($P = .001$). Tobacco counseling occurred in only 4.4% of visits for asthma and 0.3% of visits for OM. The difference in prevalence rates by visit diagnosis was statistically significant ($P < .001$).

Table 3 shows the factors that were independently associated with receipt of tobacco cessation counseling at patient visits. Age, visit diagnosis, insurance type, and clinician type were each independently associated with the frequency of tobacco counseling. As a child's age increased, clinicians were more likely to counsel against tobacco (5- to 12-year-olds, odds ratio [OR]: 3.4; 95% confidence interval [CI]: 1.7–7.0; for 13- to 18-year-olds, OR: 15.8; 95% CI: 7.5–33.5). Illness visits with a diagnosis of asthma were 5 times more likely to include counseling than visits for a nonasthma/non-OM diagnosis (OR: 5.1; 95% CI: 2.4–10.9). Children and parents were most likely to receive tobacco counseling at well-child visits (OR: 6.6; 95% CI: 3.8–11.2). Visits by children with Medicaid insurance were slightly more likely to include tobacco counseling than visits by children with private insurance (OR: 1.6; 95% CI: 1.002–2.5). Midlevel providers such as nurse practitioners and physician's assistants were 3 times more likely than physicians to provide tobacco counseling at visits (OR: 3.0; 95% CI: 1.5–6.0). There were no differences in counseling delivery to children by race or ethnicity or by physician specialty.

**TABLE 2.** Prevalence of Tobacco Counseling at Well-Child Visits for Children Younger Than 18 Years

| | *N* | % Visits | *P* Value |
|---|---|---|---|
| Overall age | 5357 | 4.1 | <.001 |
| 0–1 y | 2761 | 1.4 | |
| 2–4 y | 866 | 2.2 | |
| 5–12 y | 1136 | 6.1 | |
| 13–18 y | 594 | 12.1 | |

**TABLE 3.** Multivariate Logistic Regression Model of Determinants of Tobacco Counseling at Medical Visits for Children Younger Than 18 Years

| | OR (95% CI) | *P* Value |
|---|---|---|
| Age | | |
| 0–1 y (referent) | 1.0 | |
| 2–4 y | 1.7 (0.8–4.0) | .18 |
| 5–12 y | 3.4 (1.7–7.0) | .001 |
| 13–18 y | 15.8 (7.5–33.5) | <.001 |
| Race | | |
| White (referent) | 1.0 | |
| Black | 0.8 (0.4–1.3) | .18 |
| Other | 1.3 (0.7–2.6) | .32 |
| Ethnicity | | |
| Non-Hispanic (referent) | 1.0 | |
| Hispanic | 0.9 (0.5–1.6) | .57 |
| Insurance | | |
| Private (referent) | 1.0 | |
| Medicaid | 1.6 (1.002–2.5) | .04 |
| Other | 1.8 (0.7–4.5) | .20 |
| Self-pay | 0.5 (0.2–1.3) | .18 |
| Visit diagnosis | | |
| Well-child care | 6.6 (3.8–11.2) | <.001 |
| Asthma | 5.1 (2.4–10.9) | <.001 |
| OM | 0.5 (0.2–1.2) | .07 |
| Both asthma and OM | 1.3 (0.2–8.2) | .81 |
| All other diagnoses (referent) | 1.0 | |
| Clinician type | | |
| Physician (referent) | 1.0 | |
| Midlevel practitioner (NP, PA) | 3.0 (1.5–6.0) | .002 |
| Physician specialty | | |
| General/family practice (referent) | 1.0 | |
| Pediatrician | 1.1 (0.6–2.1) | .75 |
| All other | 0.6 (0.3–1.2) | .20 |

## DISCUSSION

To the best of our knowledge, this is the first national study to link clinician reports of tobacco counseling to individual medical care visits for children. Only 4% of well-child visits included tobacco counseling despite that an estimated 43% of children live in homes with a smoking parent or family member,[8] suggesting large numbers of missed opportunities to have an impact on what is likely the most ubiquitous and hazardous environmental exposure for children in the United States. Physicians and other medical care providers self-reported tobacco-related counseling in pediatric visits in only 1.5% of all primary care contacts, 4.4% of visits for asthma, and 0.3% of visits for OM, despite the extensive body of scientific work indicating detrimental effects of ETS exposure to all children and those with asthma and OM in particular.

Smoking is a pediatric disease,[32] with effects that begin in utero and continue throughout life. SIDS, OM, and asthma all are directly affected by children's exposure to ETS. SIDS is the leading cause of death in children from 1 month to 1 year of age, and infants who live in homes in which the mothers smoke postnatally are at twice the risk for SIDS as compared with infants who do not live with a smoking mother.[33] With the success of the Back to Sleep campaign, smoking is now the greatest modifiable risk factor for SIDS.[34] Parental smoking also is linked to an increased risk of serous OM and recurrent OM, the most common bacterial infection seen in children and the most common reason for antibiotic therapy in children. The pooled ORs if either parent smokes are 1.48 (95% CI: 1.08–2.04) for recurrent OM and 1.38 (95% CI: 1.23–1.55) for middle ear effusion.[35] There is significant cost associated with OM from treatment and missed work by parents, and the antibiotics prescribed for this frequent illness have been cited as major contributors to the development of antibiotic-resistant strains of bacteria. Asthma is the most common chronic disease in children, affecting roughly 4.8 million children and leading to several hundred deaths in children each year.[36] In 1993, asthma accounted for an estimated 198 000 hospitalizations and 342 deaths among people younger than 25 years.[36] Children who live in a home with a smoker are more likely to have wheezing, with the risk of developing asthma being 1.37 if either parent

smokes.[37] Those who are exposed and have a diagnosis of asthma are more likely to have more severe disease with increased number of emergency department visits[38] and increased risk of intubation.[39] Much of the morbidity of asthma could be lessened if children and adults had less exposure to ETS. In a study from 1974, asthma severity improved in children when exposure was reduced. Ninety percent of a group of children with asthma improved when their parents stopped smoking, compared with 27% of children whose parents continued to smoke.[40]

The counseling rate for visits of infants from birth to 1 year in this study was extremely low, with only 1.4% of well-child visits and 0.7% of all visits including tobacco counseling. The reported counseling rate in visits for OM is also extremely low, with clinicians indicating that they provide tobacco counseling in only 0.3% of visits for OM. These visits certainly represent counseling directed to parents regarding tobacco cessation or ETS reduction, given the young ages of the patients themselves. Although this frequency unfortunately cannot be correlated with parental smoking status, it is distinctly lower than the previously cited regional data on self-reported tobacco counseling to smoking parents.[12,28] Similarly, the 1997 National Heart, Lung, and Blood Institute guidelines for the diagnosis and management of asthma also recommend screening and counseling parents for smoking,[41] but in this sample, only 4.4% of visits of children for asthma were reported to include tobacco counseling. This rate is also markedly lower than physician self-report data previously published.[29]

The existing recommendations by the American Academy of Pediatrics,[13,14,42] the American Academy of Family Physicians,[43] the American Medical Association,[43] the United States Preventive Services Task Force,[44] the Maternal and Child Health Bureau (*Bright Futures Guidelines*),[45] and Healthy People 2010[46] all advocate counseling parents on the potentially harmful effects of smoking on fetal and child health. These recommendations extend to every well-child visit and especially should begin in the newborn period to minimize the health hazards of ETS. Parents often do not know of the significant effects of ETS. A recent study of parents of hospitalized children found that 41% of smoking parents did not believe that their smoking had a negative effect on their child's health.[47]

Beyond the specific adverse physical effects of ETS is the impact that smoking parents have on their children's risk of smoking initiation. Among US smokers who have ever smoked on a daily basis, 91% tried their first cigarette before the age of 20.[48] Adolescents who live in a household with a smoking parent are more likely to become smokers themselves.[5] Previous studies have shown that adolescents who were known to be smokers and presented with lower respiratory tract infections were more likely to be counseled about tobacco use.[49] Similarly, in this study, adolescents were indeed 15.8 times more likely to receive tobacco cessation/ETS counseling at visits for any diagnosis, but the overall prevalence of counseling in this age group was only 3.5%. Although it could not be determined through this survey who received tobacco cessation counseling at a visit, it is important that these messages be continued to parents of adolescents as well as to adolescents who smoke. Parental smoking cessation leads to nearly one third less smoking initiation and twice the rate of smoking cessation in adolescents aged 15 to 17 years.[50]

Although >30 years of published research amply demonstrates the hazards of smoking and ETS for children, these and other data clearly demonstrate that physicians are not providing counseling frequently enough. Several studies have investigated the barriers that preclude physicians from discussing smoking cessation with patients and parents.[12,16,24,27,28,51–53] One such barrier is lack of belief that a counseling intervention will be effective. Some older research has suggested that brief physician cessation counseling without additional counseling or pharmacotherapy does not improve long-term cessation rates,[54–56] but more recent studies,[57] including the 2000 Agency for Health Care Policy and Research Tobacco Cessation Guideline[58] and a recent Cochrane Collaboration review,[59] suggested that even simple advice from a physician is effective in promoting long-term cessation. Studies regarding use of brief motivational counseling have been in the medical literature since well before the dates of this survey.[49,54–56] In the adult population, there have been improvements in the identification of smoking status and increases in the prescription of smoking cessation pharmaceuticals as they have become available. The rate of physicians' advice to smokers has now become a quality assurance measure for managed care health plans[60]; however, no such incentive has been placed on counseling of smoking parents. As stated earlier, parents often welcome such input from pediatricians.[12,16,17]

There are several limitations to this study. Unfortunately, smoking status is no longer part of the NAMCS/NHAMCS encounter records, and there is no question regarding ETS exposure; thus, correlations of recommendations based on known risk cannot be made. In addition, it is difficult both to quantify and to qualify physician counseling behavior without direct observations of the patient interviews. One physician's definition of a counseling intervention may not be the same as another's, and as such counseling may be variably reported on a questionnaire such as the NAMCS/NHAMCS. The NAMCS/NHAMCS is also a broad survey, not specifically focused on tobacco issues, and may not capture sufficient detail of the actual patient encounter. Thus, the low rates of counseling seen here may be attributable to underreporting of actual counseling, differences in perception of a counseling intervention, or actual low rates of tobacco cessation and ETS counseling. However, the NAMCS has previously been used to assess patterns of treatment of adult smokers,[61] finding then, too, that physicians' practices fell short of national health objectives and practice guidelines. In that analysis, physicians identified patients' smoking status at 67% of primary care visits and counseled for smoking cessation in 33% of these

visits.[61] The NAMCS survey has also been used previously to demonstrate low rates of smoking cessation counseling in adolescent populations.[49]

## CONCLUSION

Rates of physician and other clinician counseling to parents regarding tobacco use and ETS exposure seem to be extremely low despite well-established links of tobacco and ETS to multiple childhood illnesses and national recommendations for such counseling. Previous studies have shown that smoking parents are generally receptive to counseling from their children's pediatrician, and simple counseling interventions have a positive effect on parents' efforts to quit smoking and/or limit their child's exposure to ETS. Extrapolating information on current smoking rates and the morbidity and mortality of smoking and ETS exposure, pediatricians and other clinicians who care for children will see roughly 2 children each day who will succumb in adulthood to tobacco-related deaths.[62] Childhood exposures to ETS undoubtedly play variable but important roles in many of these impending deaths. Counseling regarding smoking cessation and ETS exposure reduction at children's medical care visits can reduce morbidity and mortality both in children and in their parents.

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