

# AMERICAN ACADEMY OF PEDIATRICS

Committee on Substance Abuse

## Tobacco's Toll: Implications for the Pediatrician

**ABSTRACT.** The disease of tobacco addiction, which is pervasive in the United States, begins in childhood and adolescence. Twenty-five percent of the population regularly uses tobacco, despite evidence that such use is the leading preventable cause of death in the United States. Tobacco use reportedly kills 2.5 times as many people each year as alcohol and drug abuse combined. According to 1998 data from the World Health Organization, there were 1.1 billion smokers worldwide and 10 000 tobacco-related deaths per day. Furthermore, in the United States, 43% of children aged 2 to 11 years are exposed to environmental tobacco smoke, which has been implicated in sudden infant death syndrome, low birth weight, asthma, middle ear disease, pneumonia, cough, and upper respiratory infection. Pediatricians play a crucial role in reducing both tobacco use (by children, adolescents, and their parents) and exposure to tobacco smoke and should rank this among their highest health prevention priorities.

ABBREVIATIONS. ETS, environmental tobacco smoke; NIH, National Institutes of Health.

### THE SCOPE OF THE PROBLEM

Every day in the United States, 6000 young people start smoking, a 50% increase since 1988.<sup>1</sup> Half of these youth will become daily smokers. In 2000, some adolescent smoking rates exceeded the 25% adult rate, with 31%, 24%, and 15% of 12th, 10th, and 8th graders, respectively, reporting recent smoking (smoking in the past 30 days) and 21%, 14%, and 8%, respectively, reporting daily smoking.<sup>2</sup> Smoking rates are higher among rural youth than among their urban peers.<sup>3</sup> Prevalence rates of cigarette smoking among students do not include those youth who drop out of school and are more likely to use tobacco than those who are in school. One study conducted in North Carolina suggests that tobacco use among elementary school children may be as high as 15% in the third through fifth grades.<sup>4</sup> These children, that is, those who start tobacco use at an early age, are most likely to continue to smoke into adult life.

Ethnic and cultural variations in tobacco use reflect multiple interactions among income, tobacco price, availability, culture, stress, genetics, age, sex, and targeted advertising.<sup>5</sup> Table 1 reveals that in 1994, cigarette smoking was highest among American Indian and Alaska Natives (39%), white (26%), and African American adults (26%), and lowest

among Hispanics (19%) and Asian American and Pacific Islanders (15%).<sup>5</sup> Youth rates were higher than adult rates in all ethnic groups except African Americans. Girls of different ethnicities smoked less than boys during the period studied except for white youth, in whom the rates were identical. Analysis of tobacco use data by ethnic group can guide us in understanding smoking patterns of such groups, developing culturally appropriate interventions, and evaluating their efficacy. Data from the Youth Risk Behavior Survey demonstrate that for the period 1991 to 1997, rates of smoking increased 28% for white youth, 34% for Hispanic youth, and 80% for African American youth.<sup>6</sup>

In the last several years, cigar smoking among youth has become more prevalent. In 1997, 22% of high school students reported smoking cigars in the past month (31% of boys and 11% of girls). Smokeless tobacco remains a problem as well, with 16% of male, though only 1.5% of female, students reporting use.<sup>6</sup> Use of chewing tobacco and snuff tends to be greater among white youth who live in the South and Midwest regions, participate in organized sports, smoke cigarettes, and perceive friends to approve of or be indifferent to the use of smokeless tobacco.<sup>7</sup> Although cigarette smoking is more prevalent among low-income, low socioeconomic populations, 10% to 15% of middle-income college-educated adults are smokers, and, according to a California study, cigar smoking is actually more common among those of middle and upper income as well as those with higher educational backgrounds.<sup>8</sup>

As with smoking, environmental tobacco smoke (ETS) exposure is a class-based epidemic with rates of about 40% for children who come from families of low socioeconomic status and 20% for children from wealthier, more educated families. Consequences of ETS increase as a function of the number of cigarettes smoked because more particulate matter is discharged into the air.

### NICOTINE AS A PSYCHOACTIVE DRUG

Addiction to nicotine is a common consequence of tobacco use. A puff on a cigarette results in peak brain nicotine levels within 10 seconds, activating the brain circuitry that regulates pleasure and increasing dopamine in the reward circuits.<sup>9</sup> Ninety percent of those who will become regular smokers start smoking before age 19 years, and dependence is common after smoking as few as 100 cigarettes.<sup>10</sup> Most daily smokers meet the diagnostic criteria for "nicotine/tobacco dependence," a pharmacologically based be-

The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

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**TABLE 1.** Smoking Rates by Age and Ethnicity\*

Ethnicity	African Americans	American Indians and Alaska Natives	Asian Americans and Pacific Islanders	Hispanic	Whites
Total adults†	26%	36%	14%	18%	26%
Adult men	31%	39%	24%	28%	28%
Youth males‡	12%	41%	21%	28%	33%
Adult women	22%	33%	5%	15%	25%
Youth females‡	9%	39%	14%	19%	33%

\* From US Department of Health and Human Services.<sup>5</sup>

† All adults smoked at least 100 cigarettes in their life and smoked currently when surveyed in 1994.

‡ Youth figures represent averages for youth who smoked in the month preceding the survey from 1991 to 1994.

havioral disorder described in the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders*.<sup>11</sup> Nicotine dependence is a primary, chronic disease with genetic, psychosocial, and environmental factors influencing its development and manifestations. The disease is often progressive and fatal because smoking causes coronary artery disease, chronic lung disease, and cancer. It is characterized by impaired control over tobacco use, preoccupation with the drug nicotine, use of tobacco despite adverse consequences, and distortion in thinking, including denial of addiction. Nicotine addiction in teenagers is as severe as that in adults, and they have similar difficulty in quitting tobacco use.<sup>12</sup>

Among adolescents and adults who abuse other substances, tobacco use is extremely high, with rates of 80% to 90%.<sup>13,14</sup> Tobacco addiction has not been routinely addressed during drug treatment programs because of fear that nicotine abstinence will trigger relapse to other drugs or alcohol. However, there is evidence to suggest that offering help with tobacco cessation to recovering alcoholics is associated with prolonged abstinence from alcohol and some other drugs.<sup>15</sup>

#### DANGERS OF TOBACCO USE AND EXPOSURE TO ETS

Consequences of smoking include increased incidence of upper respiratory infection, cough, asthma, sinusitis, cardiovascular disease, cancer, impaired fertility, premature aging, and death, as well as loss of time from work and school. Smoking in children and youth has been shown to interfere almost immediately with both growth and functioning of the lungs.<sup>16</sup>

In both adults and adolescents, smoking is statistically associated with depression, anxiety, attention deficit hyperactivity disorder, and other psychiatric disorders. Teens with these disorders are significantly more likely to initiate smoking than peers without these conditions.<sup>10,17-20</sup> Conversely, teens who smoke are significantly more likely to develop depression than nonsmokers,<sup>18</sup> suggesting either a common vulnerability or a causal link. More research is needed to clarify the relationships between smoking and psychiatric disorders so that appropriate preventive and cessation strategies can be developed.

Pregnant women who smoke should be aware of increased risks to their offspring, including sponta-

neous abortion, low birth weight, sudden infant death syndrome, and long-term cognitive and behavioral problems including lower intelligence and attention deficit disorder with or without hyperactivity.<sup>19</sup> Recent research suggests that some children born to mothers who smoke during pregnancy have more brain nicotine receptors.<sup>21</sup> Prospective fathers who smoke need to be aware of their increased risk for developing impotence and transmitting genetic abnormalities.<sup>22</sup> Parents also need to be aware that ETS is classified by the US Environmental Protection Agency as a class A carcinogen and that exposing their children to ETS increases the risk of asthma, sudden infant death syndrome, middle ear disease, pneumonia, cough, upper respiratory infection, lower high-density lipoprotein cholesterol levels, and coronary artery disease.<sup>23</sup> Exposure to ETS before age 10 years increases the risk of developing leukemia and lymphoma as an adult.<sup>24</sup>

Smokeless tobacco is associated with precancerous leukoplakia in 60% to 78% of regular users and with increased risk of mouth cancer. Cigar and pipe tobacco use is associated with increased rates of cardiovascular disease and emphysema as well as cancers of the lung, larynx, mouth, and esophagus.

#### RISK FACTORS FOR INITIATION OF TOBACCO USE

As with other substances of abuse, early tobacco use is associated with a cluster of risk factors.<sup>25</sup> Smoking is often associated with poor school performance, low aspirations, alcohol and other drug use, school absences, and anticipated dropping out. Nicotine is frequently the first substance of abuse used by children and youth. Those who use it are 15 times more likely to progress to other drug use than those who have never smoked. Environmental factors linked to tobacco use include parents, siblings, and peers who smoke, exposure to tobacco advertising, and the portrayal of tobacco in the media. Tobacco advertising appears to be a more potent influence than parents or peers, perhaps because it affects perceptions of the pervasiveness, image, and benefits of smoking.<sup>12</sup> Personal characteristics correlated with child and teen cigarette smoking include low self-esteem, poor self-image, low perceived self-efficacy, susceptibility to peer pressure, novelty seeking and rebelliousness, ignorance of smoking-related adverse effects, depression, and anxiety.<sup>26</sup> Genetic factors appear to influence the pharmacologic reaction to nic-

otine; some of these appear to be linked to genes that influence the expression of alcoholism.<sup>26</sup>

Initiation of tobacco use is more closely associated with environmental factors, while progression from the first cigarette to additional cigarettes appears more influenced by personal and pharmacologic factors. The sociodemographic factors of low socioeconomic status, low level of parent education, and being in the transition years between elementary and high school (ages 11–16 years) correlate closely with initiation.<sup>26</sup> Protective factors in the individual, family, and environment that can guard against risky behaviors such as tobacco use include close communication with parents, positive parental support, high self-esteem, assertiveness, social competence, school success, regular church attendance, and a strong sense of right and wrong—factors that can be encouraged in the context of a pediatric office visit.<sup>27</sup>

#### ADDRESSING TOBACCO USE IN THE OFFICE

A “no-smoking office” with appropriate signs, magazines without tobacco advertising, and tobacco-free posters, literature, and referral resources may help counter the omnipresent tobacco advertising.<sup>28</sup> The National Institutes of Health (NIH) guidelines for pediatricians to address tobacco<sup>29,30</sup> and the US Public Health Service Tobacco Use and Dependence Clinical Practice Guideline<sup>31,32</sup> present 6 components that can guide pediatricians in addressing tobacco use by children and adolescents:

1. **Anticipate:** Provide age-appropriate education to parents and children. Compliment children and youth who are nonsmokers.
2. **Ask:** Inquire about ETS exposure and tobacco use by parents, children, and youth, and record it prominently in the patient’s chart or in the problem list.
3. **Advise:** Use clear, personal, relevant messages to advise parents and youth who use tobacco to quit.
4. **Assess:** Assess if the tobacco user is ready to quit. Use motivational interviewing techniques and repetition to encourage those not yet ready to quit to consider quitting.
5. **Assist:** Target self-help and referral information to those who are ready to quit.
6. **Arrange follow-up:** Schedule follow-up visits to enhance the motivation to quit and to provide encouragement and help with relapse prevention for those who have successfully quit.

As alluded to earlier, the pediatrician’s tobacco prevention activities should begin at the time of the prenatal visit with a discussion of the effects of smoking on the unborn infant. For infants and toddlers, tobacco prevention activities ideally begin at the very first visit. The pediatrician should assess tobacco use and ETS exposure in the extended family and environment, encourage smokers to smoke outside the home and to consider quitting, and provide relapse prevention for women who quit during pregnancy (50%–90% chance of relapse) and for other family members who have quit.

During health care visits for young children, the

pediatrician can explore what the children have learned about tobacco and what they think about smoking. Children from families whose members smoke or use drugs are at high risk for starting tobacco use early. In these cases, the pediatrician can encourage tobacco, alcohol, or other drug treatment for parents and promote protective factors such as positive parenting skills and good communication. Children who are experimenting should be given a brief motivational interview to stop, and should be encouraged to find activities that will promote a smoke-free lifestyle.

It is critical to discuss the issue of tobacco, alcohol, and other drug use confidentially with every teen at virtually every visit. Parents can be encouraged to be role models for a tobacco-free lifestyle and establish a clear standard of no tobacco use because these behaviors are associated with a lower rate of initiating smoking.<sup>33</sup> The pediatrician can explore the teen’s knowledge of short-term risks of smoking (such as cough and shortness of breath) and chewing tobacco (such as gingivitis and bad breath), clarify misperceptions, and reinforce and rehearse refusal skills.<sup>34</sup> Teens who use tobacco should also be advised to quit. Because they are at risk for other substance use, an appropriate assessment may be indicated.<sup>25</sup> All these interventions will be most effective if done in culturally appropriate ways.

#### ADDRESSING TOBACCO CESSATION IN THE OFFICE

The pediatrician should be prepared to discuss the issue of tobacco cessation at every opportunity. Whether identifying tobacco use during a routine health check or dealing with an illness precipitated by tobacco use or ETS exposure, cessation advice, treatment, and referral should be offered to parents or patients as appropriate. Although not every tobacco user is ready to quit, a personalized message and a brief motivational interview may be helpful in moving a tobacco user along the so-called “stages of change” from having no interest in quitting (“precontemplation”) to interest (“contemplation”) to making plans (“preparation”) to actually doing something (“action”).<sup>35</sup> Success in quitting is facilitated by a patient, persevering, nonjudgmental, empathic approach on the part of the pediatrician. Supportive counseling and group interventions have been shown to be an effective part of a comprehensive nicotine treatment program for teenagers. However, all parties must recognize that relapses are common, and that they represent learning experiences on which the next quit attempt can be built.

Those who smoke 10 or more cigarettes a day may benefit from systemic nicotine replacement therapy supplied by patches, gum, spray, or inhaler. Bupropion, clonidine, and nortriptyline are additional therapeutic modalities. Various combinations of these products may increase abstinence rates at 1 year from the baseline of 5% (for self-help programs alone) to as high as 20% to 35% at 1 year in adults.<sup>36</sup> Recent research suggests that pharmacotherapy can be useful and safe in adolescent tobacco users.<sup>37</sup>

## ROLE OF THE PEDIATRICIAN IN THE COMMUNITY

Recent political and legal strategies have shown clearly that lower rates of tobacco use, especially in young people, depend on a comprehensive, broad-based, and sustainable effort to restrict the desire for and availability of the product. Pediatricians can be strong advocates for such programs when these major components are included:

- raising excise taxes on tobacco;
- increasing public education on the dangers of tobacco use and ETS;
- decreasing advertising and promotion of tobacco products and encouraging the development of antitobacco advertising;
- increasing awareness of the fact that most people (75% of the population) do not use tobacco products;
- improving enforcement of youth access laws; and
- promoting media coverage of tobacco issues.

By extending their reach into the community to interface with schools, parent groups, civic and religious organizations, and other health professionals, pediatricians can be an instrumental force in decreasing tobacco use by youth.

### CONCLUSIONS

1. A tobacco-free environment is imperative, because tobacco is a major health hazard to infants, children, adolescents, and their families.
2. Parental use of tobacco has significant adverse effects on pregnancy and fetal outcome.
3. ETS is a class A carcinogen, exposure to which has major effects on the health of children.
4. Tobacco use by children and youth is associated with chronic and recurrent medical problems and with premature death in adults.
5. Tobacco use by children and youth belongs to a cluster of risk behaviors that includes rebelliousness, early sexual activity, academic failure, and use of other substances.
6. Nicotine is an addicting substance, which, as with those who abuse alcohol, is more likely to lead to the use of illicit substances.
7. Tobacco advertising and promotion are appealing to young people and make a powerful impression influencing them to experiment with cigarettes, cigars, and smokeless tobacco.
8. Extensive research is needed on effective individual and group tobacco dependence treatment programs for teens who use tobacco, including those who are addicted to nicotine.

### RECOMMENDATIONS

1. Inquiry about tobacco use and smoke exposure is critical at all pediatric office visits. Responses should be prominently recorded in the patient's chart or in the problem list.
2. As important role models, pediatricians are urged not to smoke or use tobacco products and should maintain a tobacco-free office environment and attempt to limit reading materials con-

taining tobacco advertising. They should be firm advocates of nonuse by children and their parents and advocate for a smoke-free environment wherever children are present.

3. The dangers of ETS and the risk of role modeling tobacco use should be discussed with parents and caretakers who smoke and reinforced with culturally and ethnically appropriate written information and cessation referrals.
4. Discussion and anticipatory guidance about smoking and tobacco use should ideally begin by age 5 years, with particular emphasis on resisting the influence of advertising and rehearsal of peer-refusal skills. This deserves special attention when a parent or regular caretaker is a smoker, including repeated nonjudgmental efforts to encourage the parent to quit smoking (accompanied by appropriate referral), a high index of suspicion for early onset of smoking in the child, and encouragement of protective factors.
5. Pediatricians should be knowledgeable about tobacco cessation and routinely offer help and referral to those who are nicotine-dependent, including those who are recovering from alcohol and other drug dependence.
6. Hospitals, medical offices, schools, child care programs, and other places frequented by children should maintain a tobacco-free environment.
7. Pediatricians should support comprehensive tobacco prevention, education, and cessation programs and policies within schools and be available to provide consultation for these programs.<sup>38</sup>
8. Pediatric residency training programs and continuing medical education programs should implement training programs for medical students, residents, and pediatricians that discuss tobacco prevention, intervention, and cessation.
9. Pediatricians should support research into effective treatments for tobacco dependence in teens as well as efforts to secure appropriate funding for such treatment.
10. Pediatricians should urge adolescent substance abuse treatment programs to treat tobacco dependence in their patients and their families and consider adopting a tobacco-free policy.
11. Pediatricians should advocate for state and federal legislation that provides the Food and Drug Administration with authority to regulate nicotine and tobacco products including restricting sales, access, marketing, and promotion of tobacco products. They should also work with state authorities to promote programs that contribute to decreased tobacco use by youth.
12. Pediatricians should encourage health insurance companies to provide coverage for comprehensive tobacco cessation treatment, including individual and group counseling and pharmacologic modalities.

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