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Tobacco Control for Clinicians Who Treat Adolescents

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ABSTRACT Smoking remains the most common preventable cause of death in the developed world, and is rapidly becoming an important cause of death in the developing world. Nicotine is a powerfully addictive substance, and the tobacco industry spends billions annually promoting it in the United States. It is therefore important for clinicians to understand why people smoke, to address smoking in patients of all ages, and to lobby for health-preserving tobacco control policies at the community level. Children take up smoking in response to social influences: smoking by friends, parents, and family, and through exposure to smoking in media. Parents who smoke not only model the behavior, but also often make the product available by leaving cigarettes around the house. Media influences include the $10 billion spent per year on tobacco marketing, but more importantly, the modeling of the behavior on screen by movie and television stars. Once children start smoking, many rapidly lose autonomy over the behavior. Youth can get hooked after smoking just a few cigarettes. The most effective community efforts for reducing tobacco use are: raising the price of tobacco; halting the sale of tobacco to minors; enforcing strict school tobacco policies; and making public places smoke free through local ordinances. Working with individuals, clinicians should support cessation in all smokers, including parents of children and adolescents. They should screen children for smoking risk factors beginning at age 10. They should teach parents to maintain smoke-free households, to set nonsmoking expectations early on, and to monitor adolescents for signs of smoking. Parents should limit exposure to adult media (e.g., R-rated movies) and use family television time to discuss the effect of seeing screen depictions of smoking on adolescent behavior. Adolescents who smoke should be assessed for signs of nicotine dependence and counseled about quitting. Clinicians are effective community voices; they should participate in efforts to raise tobacco taxes, limit the display of tobacco advertising, and make public places smoke free because of the adverse health effects of passive exposure to cigarette smoke. *(CA Cancer J Clin 2003;53:102-123.)* *© American Cancer Society, 2003*.

INTRODUCTION

Why Do Children Use Tobacco?

The onset of tobacco use typically occurs during childhood or adolescence. Many risk factors have been identified. Children aren't born knowing how to smoke; instead, smoking is an acquired, stylized social behavior. Social learning theory posits that children adopt behaviors in part through observation.[1] Social influences refer to environmental factors that give children a picture of how to smoke and what they might gain by smoking. Children imitate the behavior of their

parents, peers, and other role models, especially those with whom they identify or otherwise admire. Some factors exert their influence early in life. For example, children in elementary school who initiate smoking are responding mainly to family influence: parent and sibling modeling of the behavior and the availability of the product in the household. Beyond the age of 12, peer smoking becomes a dominant social influence. Media has also been identified as an important social learning factor that influences behaviors.[2-4]

In addition to social learning factors, some children are born with personality characteristics that place them at higher risk for smoking. Pessimism, poor problem solving skills, disaffection, poor school performance, and sensation seeking are all associated with increased risk of tobacco use. Many of these risk factors occur in clusters. Youth with friends who smoke also watch more movies depicting smoking, and perform more poorly in school than youth whose friends do not smoke. The following provides an overview of some of the more important risk factors for smoking initiation in children and adolescents. Understanding risk factors can help clinicians identify adolescents who are at high risk for taking up the behavior.

SOCIAL INFLUENCES

Friends

Youths become increasingly peer oriented as they approach middle school. They adopt a peer group that tends to reflect their values and interests. When a friend adopts smoking, it becomes a powerful influence to smoke; never-smokers whose peers smoke are about twice as likely to initiate smoking over the next year or two.[5] Despite a great deal of media and even programmatic attention to the concept of "peer pressure," adolescents rarely describe themselves as being "pressured" to try a cigarette. Instead, youths voluntarily take up smoking in an effort to fit in and gain acceptance with a group of peers.[6] Friends who smoke together develop a social culture around tobacco. A big part of that culture involves sharing cigarettes with each other, and in this way, friends who smoke help perpetuate the behavior.[7] Parents are often able to have an impact on which friends their children socialize with, especially before children reach adolescence. Parents should be instructed to monitor the smoking status of their adolescents' peers, and steer their adolescents away from youth who smoke.

Parents

Transmission of smoking within families may be related to genetic factors, social influences, or easy access to tobacco.[8,9] The effect of family smoking is strongest during elementary school years.[10] This effect weakens in older adolescents, and is not a strong predictor of who will become an established smoker among those who initiate in high school.[7,11] Parental smoking may affect adolescent smoking by offering the adolescent ready access to cigarettes. Given children who are attitudinally receptive to taking up smoking, those who can easily obtain the product should be more likely to actually carry out their intentions. Supporting this notion, children whose parents maintain a smoke-free home are less likely to take up smoking, independent of parent smoking status.[12]

In contrast to parental smoking, some parenting practices have a moderately strong association with children maintaining a never-smoker status throughout adolescence. Authoritative parenting is a concept developed by Baumrind during the 1960s.[13] Authoritative parents are responsive to their children and also able to set limits. Responsiveness is about listening to a child's concerns and responding in a way that validates his or her opinions. At the

same time, authoritative parents have no difficulty making demands and setting expectations. They tend to monitor their child's behavior more closely than non-authoritative parents. Children with authoritative parents have lower rates of tobacco and substance use.[13,14]

Parental attitude toward smoking appears to be more important than parental smoking behavior.[10,11,15] In a prospective study, adolescents who perceived that their parents would be upset by their smoking were about half as likely to take up smoking over the next two years, regardless of parental smoking status.[16] Adolescents who perceived their parents had become more lenient over time had increased chances of smoking.

Use of tobacco-specific parenting as an intervention to prevent smoking is an area under active investigation at this time. The question being asked is, "Can parents be taught to socialize their children not to smoke?" From the parent perspective, anti-smoking socialization involves: a) perceiving that there is something you can do to affect the chance that your child will smoke; b) discussing your own smoking history, and explaining addiction (especially for smoking parents); c) communicating that negative consequences will follow if the child is caught smoking; d) giving positive reinforcement of smoke-free status; e) teaching your child media literacy; f) preparing your child to respond to peers; and g) monitoring for/and responding to your child's smoking initiation.[17]

Clinicians should actively counsel parents about quitting smoking. Parents can be motivated to quit by informing them of the hazards of environmental tobacco smoke on children, and by pointing out the impact of their smoking behavior. Those not willing to quit should be encouraged to maintain a smoke-free household because it limits family exposure to secondhand smoke and decreases the likelihood that their children will take up smoking. In addition, parents who use tobacco should keep it in a place where children and adolescents cannot access it. Finally, clinicians should communicate the key elements of anti-smoking socialization to all parents beginning when their children enter elementary school, and work with them over time to consolidate these parenting practices.

Media

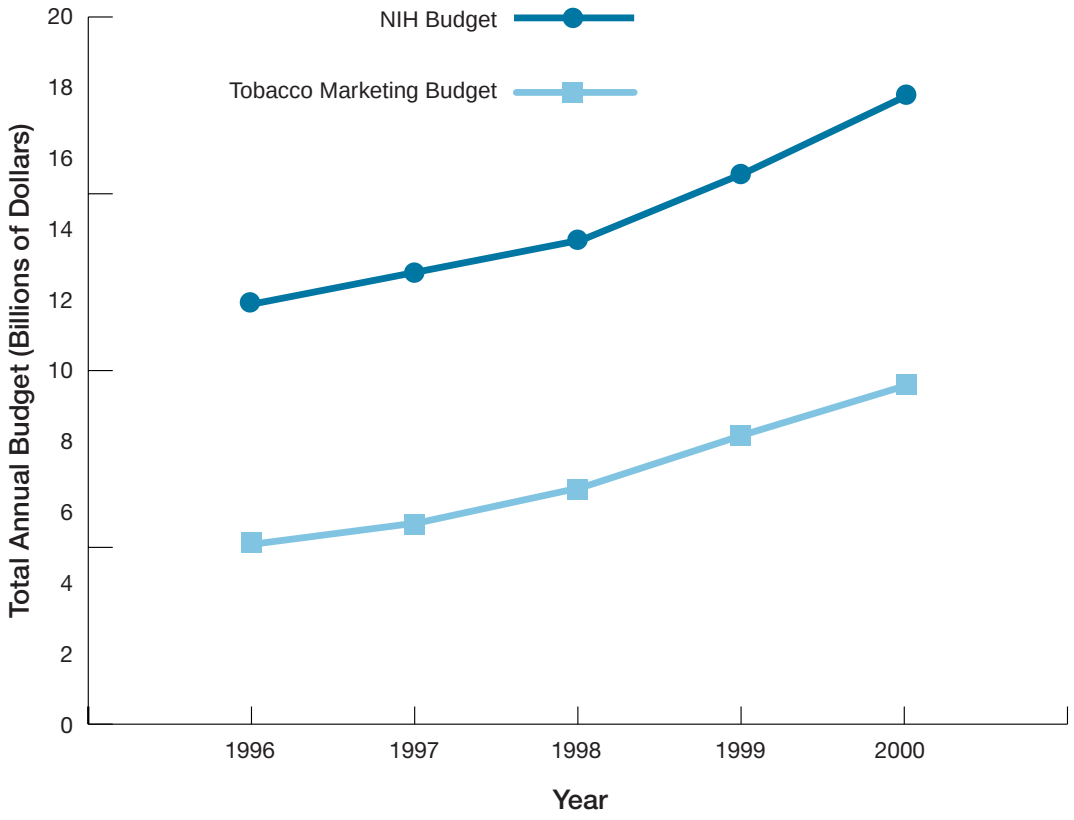
Tobacco Marketing

Tobacco companies spend enormous sums marketing their products, and the relation between tobacco marketing and youth smoking has been an intensive area of study. Only automobiles are more heavily marketed. Tobacco companies have been required to report their marketing expenditures to the Federal Trade Commission since 1963. Their annual budgets have doubled every 5 to 10 years since then, totaling $5.1 billion in 1996 and almost $9.5 billion in 2000 (Report available at: http://www.ftc.gov/os/2002/05/2002cigrpt.pdf), the most recent year for which data are available. Spending to promote tobacco use equals more than half of the total budget of the National Institutes of Health (Figure 1). The worldwide epidemic of tobacco-induced diseases continues to worsen because far more is spent promoting tobacco use than is spent on the public health effort to curtail the epidemic.

Marketing expenditures can be divided into advertising and promotional activities. Advertising is generally aimed at creating a "personality" for a product by associating it with favorable social images. A brand's personality is built with attractive imagery in magazines, newspapers, and at racing events (which is one way to get brands onto the television screen). Since the 1998 Master Settlement Agreement (MSA), all billboard advertising of tobacco has been banned in the United States (as of April 1999). Advertising affects youth smoking by associating cigarette

FIGURE **1**

Total Amount Spent on Tobacco Marketing Compared With the Budget for the National Institutes of Health (NIH)



brands with images of strength and independence (Marlboro), having a good time (Newport), and sexual potency (Kool) among other characteristics that appeal to adolescents. The ads don't have to depict smoking; for example, ads for Newport (the second most popular brand among adolescents) show young people having a good time together without showing anyone smoking. Youth smoke highly advertised premium brands; the top three brands among adolescents are Marlboro, Newport, and Camel cigarettes. The Joe Camel cartoon campaign was associated with a dramatic rise in its market share among adolescents.[18,19] By contrast, discount brands hold a sizable share of the adult market. Dozens of studies demonstrate that tobacco advertising has a profound influence on youth.[19-25]

Promotional expenditures are aimed at prompting a product purchase. They include benefits to retailers who prominently display a product (or make it easy to steal) as well as coupons and two-for-one offers aimed at price-sensitive customers. Because they are used to counter increases in tobacco taxes, promotional expenditures have gained a progressively larger share of the marketing budget, accounting for less than 10 percent in 1963 but over 80 percent in 1990.[26] The industry has also been forced to rely more heavily on promotional activities at retail outlets because of restrictions imposed by the MSA. Promotions affect adolescents in two ways, by lowering the net cost of cigarettes

(adolescent smokers are sensitive to price) and by associating items of clothing and other paraphernalia with a tobacco brand. During the early 1990s, both Marlboro and Camel launched multi-billion dollar gear campaigns designed to get branded items into the hands of young people. By the middle of the decade, surveys indicated that Marlboro hats, t-shirts, and backpacks were showing up in public schools.[27] The items were highly visible; whereas only five percent of kids reported bringing them to school on the day of the survey, some 50 percent reported seeing them. In addition, ownership of a branded item or willingness to use it is strongly associated with smoking in both cross-sectional and longitudinal studies.[23,28-31] The strength of this evidence formed the basis for the ban on promotional item distribution in the MSA. Since this ban, tobacco companies have continued to distribute articles of clothing, but these items are not supposed to bear a cigarette brand label.

Parents should be instructed not to bring tobacco promotional items of any kind into their household. These items are often acquired at local and regional racetracks, where it is still legal to give them away. Clinicians can also help reduce the impact of tobacco promotions at the local level by writing to store owners who prominently display tobacco advertising, especially if the store is situated near a school. At the state and national level, clinicians should support attempts to limit image advertising of this nature.

Movies and Television

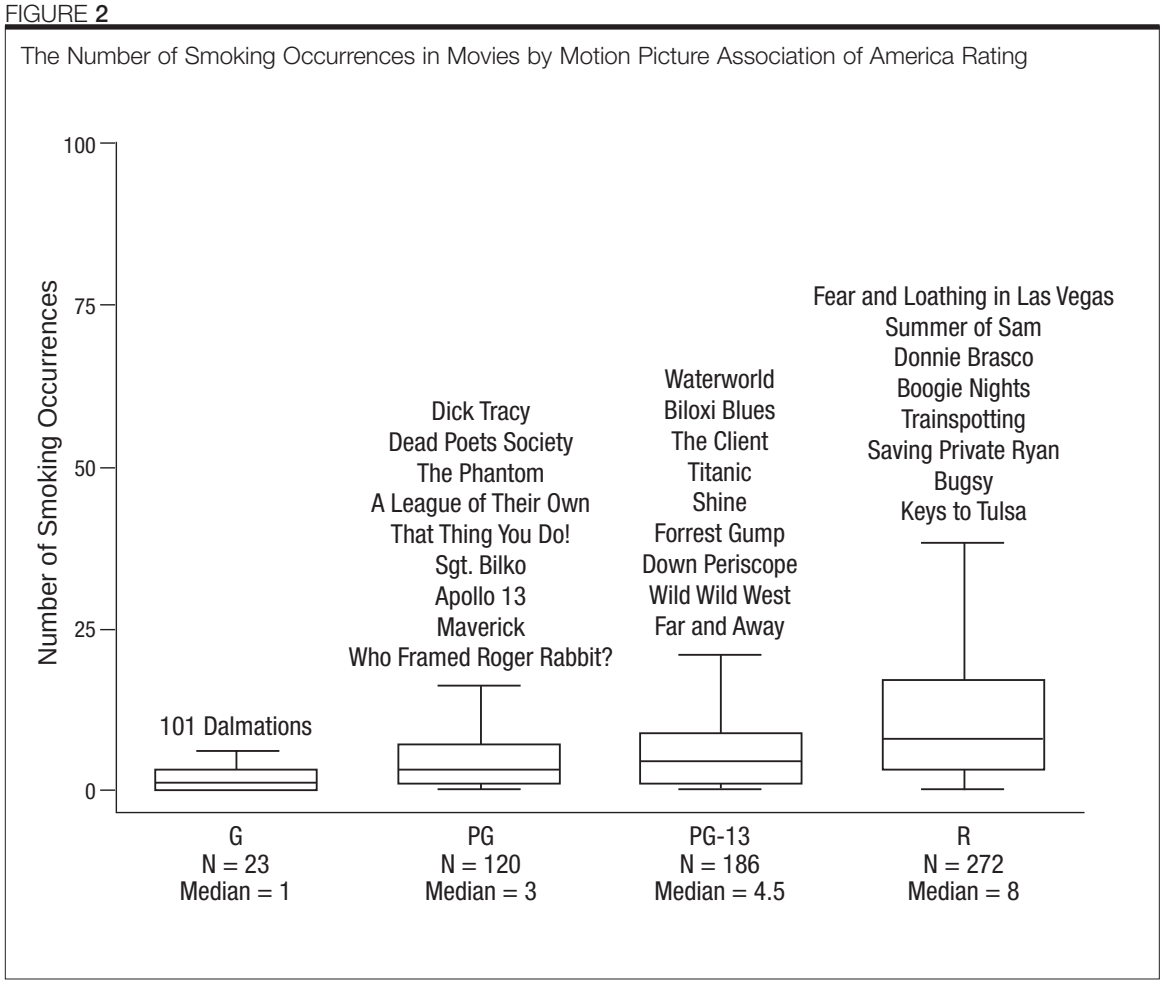
In 1998, the Kaiser Family Foundation surveyed the media habits of a nationally representative sample of American children.[32] The survey found that adolescents are exposed to an average of two hours of television per day and two to three movies per week. In addition, adolescents are avid readers of magazines and also spend time searching the Internet. Clearly, mass media plays a prominent role in the life of the contemporary adolescent. Adolescents gain information about their world and about smoking by watching celebrity behavior in the media.

How much smoking are kids exposed to in the movies? All but 10 percent of movies contain scenes with smoking.[33] Figure 2 depicts the number of smoking occurrences in 600 contemporary popular motion pictures. There is a wide range with some movies containing little or no smoking and some containing as many as 100 smoking depictions. The median number of depictions per movie rises with movie rating; the average G-rated movie contains one smoking depiction and the average R-rated movie contains eight. Finally, since most popular movies are rated either PG-13 or R and with video systems in nearly every home in the United States, young children are routinely being exposed to movies meant for adults. For example, some 40 percent of fifth graders in our sample had seen the R-rated horror thriller *Scream*.

Smoking in movies does not look like real-life smoking. You rarely get the impression that smokers are compelled to smoke because of their own addiction. The smokers are, for the most part, affluent and powerful and, because of their star status, larger than life, in contrast to real-life smokers who are more likely to be poor. Actors smoke in the context of romance, or to appear tough and personify the bad guy or girl, and also to relieve stress—all situations adolescents might aspire to. Finally, actors are increasingly endorsing brands when they smoke on screen, even though paid brand placement was eliminated by the MSA.[34] A typical brand appearance is seen in Figure 3 taken from the movie *Great Expectations*, released in 1998. In this scene, Ethan Hawke offers Kools to Gwyneth Paltrow while drinking in a New York nightclub.

Brand appearances in movies are part of a

FIGURE **2**



Note: The middle, upper, and lower bounds of the box plot represent the median and the interquartile range.

larger advertising trend that aims to place brands in movies and television shows in response to the weakening effectiveness of paid commercial advertising. Brand placements are a particularly effective form of advertising because the public does not view them with the same skepticism as other advertising. Because movies are marketed globally, cigarettes placed in movies are viewed by an international audience.[34]

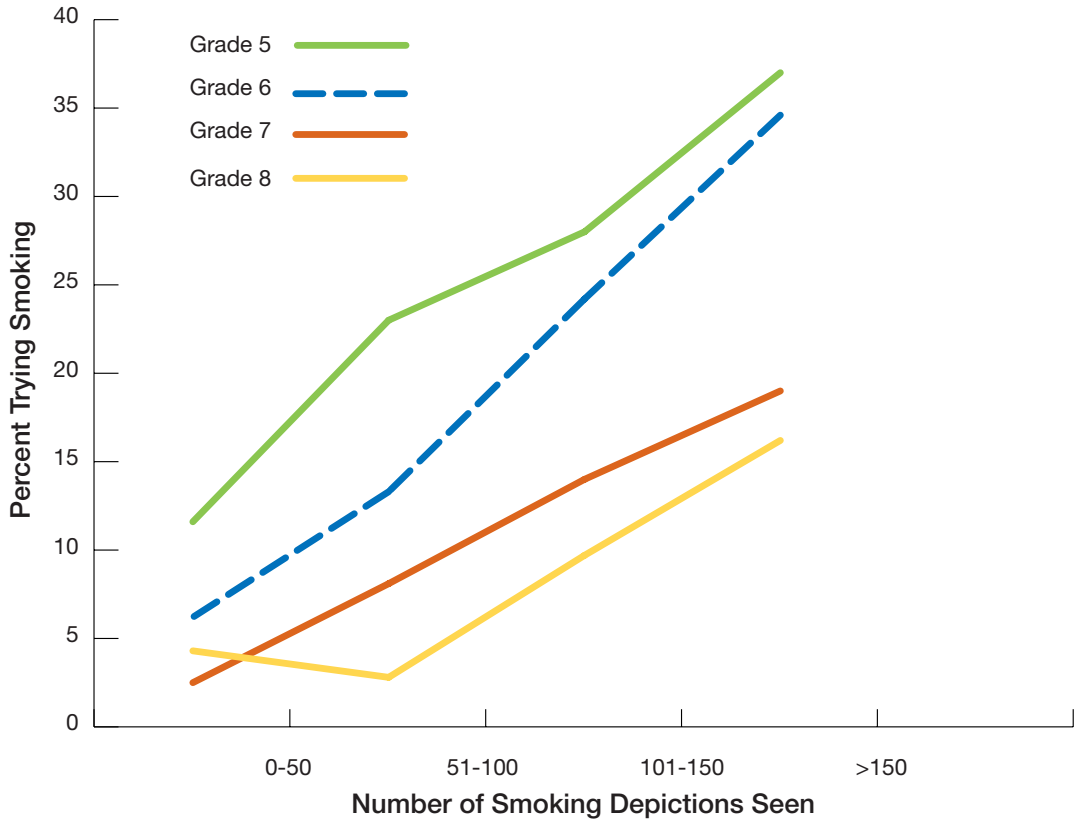
The high frequency of smoking in movies coupled with adolescent viewing habits combine to produce high adolescent exposure to the movie-smoking stimulus. A recent survey

FIGURE **3**

Ethan Hawke endorsing Kools in the movie *Great Expectations*.

FIGURE 4

Relation of Exposure to Movie Tobacco Use and Trying Smoking Among Young Adolescents



Note: Exposure is categorized by the number of tobacco occurrences the adolescent was exposed to from a sample of 50 contemporary movie titles.

asked adolescents if they had seen 50 movie titles randomly selected from a pool of 600 popular contemporary movies.[35] The average adolescent had seen 17 of the 50 films, and had been exposed to 91 smoking depictions. Estimating exposure to the sample of 600 films, the average adolescent had seen about 1,000 smoking depictions. Viewing smoking in movies is a strong risk factor for the initiation of smoking,[35] and appears to operate through promoting more favorable attitudes toward smoking among never-smokers.[36] As shown in Figure 4, fifth graders with high exposure to movie smoking had higher smoking rates than eighth graders with low exposure. This association remained after controlling for some 16 other social influence, personality, and parenting factors. In addition, from an intervention standpoint, children who reported parental restrictions on R-rated movie viewing had a substantially lower risk of smoking and drinking.[37] If these findings are confirmed in longitudinal studies, restrictions on viewing R-rated movies could become an important part of anti-smoking socialization.

Clinicians should discuss media influences

on children's behavior with parents in order to motivate them to restrict access to PG-13 and R-rated movies for as long as possible. Parents should be encouraged to learn more about how they can program their televisions or cable boxes to block adult material from view by young channel surfers. Clinicians interested in voicing their disapproval of on-screen smoking in movies may want to become involved in a national campaign to pressure movie companies to limit on-screen smoking. For more information about this campaign visit: http://smokefreemovies.ucsf.edu/.

Personality

Some adolescents have personality characteristics that make them more apt to experiment with tobacco. Others have interests that make them more likely to find themselves in situations where peers smoke. The following is a list of personality characteristics associated with taking up smoking.

Sensation Seeking

Sensation seeking refers to the tendency to seek out novel, exciting experiences. It is related to the concept of risk taking. Some kids are by nature cautious, others are more willing to take risks and try new things. Sensation seekers are more likely to try a number of risky activities, from physical risks (jumping a bike or skateboard) to experimentation with tobacco or other drugs.

Rebelliousness

Rebellious adolescents are more likely to question authority. To the extent that adolescent tobacco use is restricted by authority figures, smoking could consolidate that identity for a rebellious teen. Advertisements for Virginia Slims encourage teenage girls to smoke to rebel against authority. Not surprisingly, rebelliousness is an independent predictor of teen smoking. However, it is important to remember that most teens aren't all that rebellious. It is a common misconception that teen rebellion explains why they engage in risky behaviors. In fact, most teens score low on rebelliousness scales. For example, when we surveyed over 5,000 young adolescents, 90 percent scored seven or less out of a possible 21 points on a rebelliousness index, and 25 percent scored zero.

Poor School Performance

Teens who perform poorly in school are more likely to become smokers.[38] Poor school performance is a marker for a number of factors that increase the risk for smoking. As elaborated by Wills, et al.,[39] academic performance relates not only to IQ, but also to dimensions of temperament—character traits that emerge during the preschool period. High activity levels, negative emotionality (becoming easily and intensely upset), and rigidity (difficulty adapting to change) are strongly linked with poor self-control, which in turn is linked with poor academic performance and higher rates of substance use. Some temperament factors are protective. For example, positive emotionality (the tendency to easily and frequently experience positive mood) and approach (tendency to enjoy and approach new situations and people) are related to good self-control and are predictors of good academic performance. Children who are perceived as negative, rigid, and overly active often get little positive feedback from their school experience and develop poor self-esteem. If this cycle is not broken during elementary school, they will become alienated from school as adolescents. They are less likely to be engaged in organized sports (a protective factor), and tend to have more unstructured free time. These adolescents are more likely to enter the workforce as teens where they are exposed to adult smokers and are much more likely to

eventually drop out of school. More than half of school dropouts smoke.[40,41]

Attitudes That Predict Smoking

Attitudinal factors include intentions, positive utilities, and normative views of smoking. Intentions regarding smoking in the future are an important measure of attitudinal susceptibility. An adolescent is susceptible to smoking if he or she cannot answer "definitely not" to the questions: "Do you think you might smoke in the next year?" and "Would you smoke if your friend offered you a cigarette?" Susceptibility represents a softening of the resistant stance most elementary school-aged children have toward smoking. Those who cannot rule out smoking are twice as likely to initiate smoking over the next year or two.[42-44]

Adolescent notions of what might be gained by smoking are termed positive utilities. They are measured by the adolescent's endorsement of statements like, "Smoking makes a person more popular," and "Smoking makes it easier for me to be around friends." The more an adolescent thinks might be gained by smoking, the more likely he or she is to start.[45-47] This contrasts with negative utilities (like "Smoking will make your teeth yellow."), which do not offer much protection against the adoption of smoking.[45,46,48,49] Interestingly, most medical providers emphasize the negative health consequences of smoking: factors that most adolescents already understand and which do not have much impact on their behavior, especially when the adolescent has had no personal experience supporting them.

Many adolescents view smoking as normative, that is, they think that most of their peers smoke. Youth who feel this way are more likely to start smoking.[50,51] One educational aim of successful school-based social influence programs has been to teach adolescents that most of their peers do not smoke.[52] Many public health strategies attempt to "denormalize" tobacco use.

Availability

Young people must obtain tobacco to use it. In one study of adolescents, the best predictor of smoking was that cigarettes were perceived as easily available.[53] One reason why parental smoking may contribute to smoking by their children is the ready availability of tobacco; 59 percent of adolescent smokers reported stealing tobacco from a parent in one small study.[54] Youth who had stolen tobacco from their parents reported initiating smoking one year earlier than their smoking peers who had never stolen tobacco from a parent.[54] Thus, the children of smokers are among the first to take up smoking, and by sharing their stolen cigarettes, they help to addict their friends to nicotine.[54]

GETTING HOOKED

There are many different definitions of addiction and dependence, and these terms are often used interchangeably. The Diagnostic and Statistical Manual of Mental Disorders defines when the use of tobacco has reached a degree of impairment that qualifies as a mental disorder.[55] This approach to defining dependence is better suited for adult tobacco users. When studying the onset of tobacco use, a more useful approach is to establish when the individual loses his or her full autonomy over the use of tobacco. The Autonomy Theory defines the loss of autonomy as occurring when the sequelae of tobacco use, either physical or psychological, present a barrier to maintaining abstinence. The Hooked on Nicotine Checklist (HONC), a 10-question screening tool, has been developed to assess youth for the loss of autonomy over tobacco (Table 1).[56]

The HONC has demonstrated excellent psychometric properties. In a longitudinal study, HONC scores correlated with the maximum amount smoked ($r = 0.65$, $p < 0.001$) and the maximum frequency of smoking ($r = 0.79$, $p < 0.001$).[56] The internal reliability was 0.94. A one-factor solution explained 66 percent of the total variance. As predicted by the Autonomy Theory, endorsement of a single item on the HONC was associated with a failed attempt at cessation (OR = 29, 95% CI = 13 - 65), continued smoking over time (OR = 44, 95% CI = 17 - 114), and daily smoking (OR = 58, 95% CI = 24 - 142).[56] The development of a single HONC symptom indicates a loss of autonomy over tobacco, which in turn is a very strong predictor of continued tobacco use.

For decades, the onset of dependence has been conceptualized by the Stage Theory as a slow and sequential process, with the daily use of at least a half a pack of cigarettes as a prerequisite for dependence.[57,58] The Development and Assessment of Nicotine Dependence in Youth study (DANDY) was the first effort to prospectively examine when the first symptoms of dependence develop in terms of the amount, frequency, and duration of tobacco use.[59] In the DANDY study, the first HONC symptom appeared, on average, only within two months after the onset of smoking (Figure 5). Among subjects who had reported a HONC symptom, the median frequency of use at the onset of symptoms was two cigarettes, one day per week, and over two-thirds reported loss of autonomy prior to the onset of daily smoking. As Figure 5 demonstrates, the rapid development of symptoms of dependence was the rule rather than the exception.

TABLE **1**

The Hooked on Nicotine Checklist

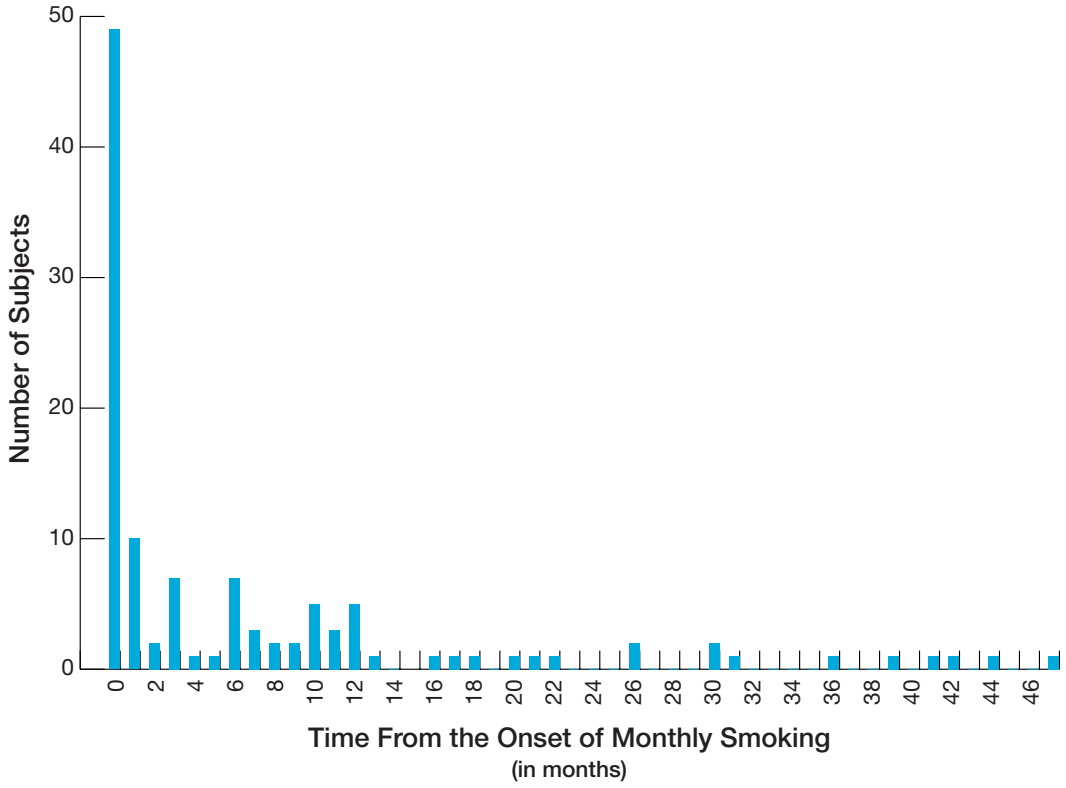
1) Have you ever tried to quit, but couldn't?
2) Do you smoke now because it is really hard to quit?
3) Have you ever felt like you were addicted to tobacco?
4) Do you ever have strong cravings to smoke?
5) Have you ever felt like you really needed a cigarette?
6) Is it hard to keep from smoking in places where you are not supposed to, like school?
When you tried to stop smoking...(or, when you haven't used tobacco for a while...)
7) Did you find it hard to concentrate because you couldn't smoke?
8) Did you feel more irritable because you couldn't smoke?
9) Did you feel a strong need or urge to smoke?
10) Did you feel nervous, restless, or anxious because you couldn't smoke?

Juvenile Onset Nicotine Dependence

Data from a wide variety of studies involving both humans and animals suggest that nicotine dependence is more severe if it begins during adolescence. Individuals who begin smoking during adolescence are more likely to become dependent, to progress into daily smoking, to continue to smoke into adulthood, to smoke for a greater number of years, and to smoke more heavily as adults.[60–65] Difficulty with quitting prior to smoking 100 cigarettes is reported twice as often by adolescents less than 19 years of age than by individuals aged 19 to 22 years old.[66] The adolescent's greater vulnerability to nicotine may derive from the fact that the adolescent's brain is still developing. In rats, nicotine infusions produce more extensive upregulation of midbrain nicotinic acetylcholine receptors in adolescent rats than in adult rats.[67] Also the effect is more persistent in the adolescent, with upregulation still evident one month into withdrawal among adolescents, but not in adults.[67] Nicotine induces cell damage in the hippocampus in adolescent rats, and both adolescent mice and rats demonstrate greater impairment in reward system function after nicotine exposure than do

FIGURE **5**

Incidence of Initial Symptoms of Nicotine Dependence in 115 of 332 Subjects Who Had Ever Used Tobacco



Adapted from DiFranza, et al., 2002.[59]

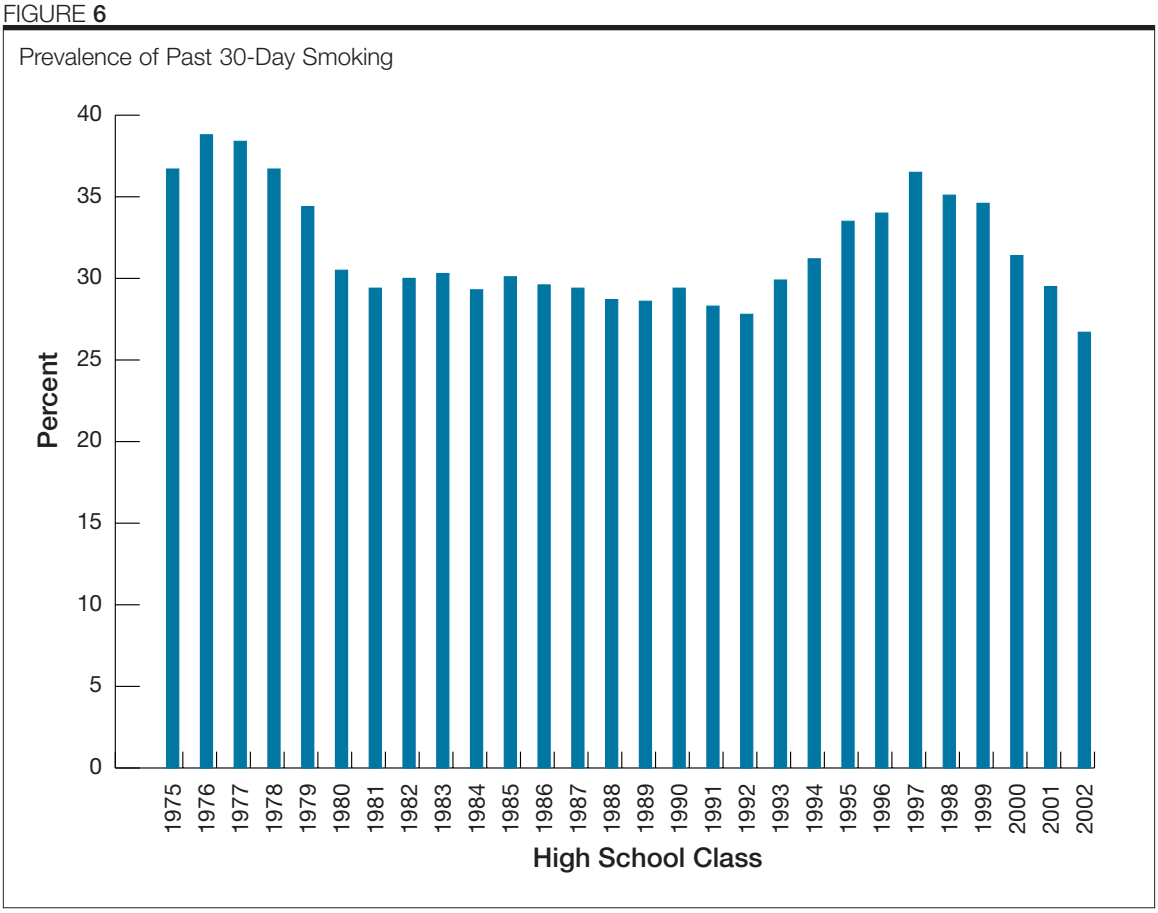
adult animals.[67-71] Nicotine can have different and sometimes opposite behavioral effects in adolescent and adult animals.[72,73] The animal data indicate that the adolescent mammalian brain is particularly vulnerable to nicotine, and human studies indicate that juvenile onset nicotine dependence is more severe, perhaps reflecting a more pronounced disruption of neurological function.

EPIDEMIOLOGY OF ADOLESCENT TOBACCO USE

The commonly accepted measure of smoking in adolescents is 30-day smoking (whether or not the adolescent has smoked one or more times in the past 30 days). The historically higher prevalence of smoking among boys disappeared during the 1970s, and coincided with an effort to market cigarettes to women and girls (Virginia Slims, among others).[26] The prevalence of cigar and smokeless tobacco use is much higher among boys than girls.[26] Tobacco use rates vary dramatically between racial and ethnic groups. For the high school class of 2000, the prevalence of past 30-day smoking was 37.9 percent among Whites, 27.7 percent among Hispanics, and only 14.3 percent among Blacks.[74]

Among 12th graders, the prevalence of smoking during the preceding 30 days peaked in 1976 at 39 percent,[74] perhaps reflecting the adoption of misguided school smoking policies

FIGURE **6**



Adapted from Johnston, et al., 2001.[74]

that provided students with smoking areas on high school campuses (Figure 6). From 1976 to 1981, this figure dropped by one quarter to 29 percent. The cause of this dramatic drop is unknown. One possibility is that the decline was a result of the ban on broadcast advertising of cigarettes, which was enacted in 1970 when the class of 1976 would have been in the sixth grade. Following 1981, the prevalence of past-month smoking remained remarkably constant for more than a decade.

In 1992, it was noted that smoking among eighth grade students had increased over the previous year. The following year, increasing smoking rates among 12th graders became evident. Among eighth graders, smoking rates increased from 14.3 percent in 1991 to a peak of 21.0 percent in 1996, a proportional increase of 47 percent. Among 10th graders, smoking rates increased from 20.8 percent in 1991 to a peak of 30.4 percent in 1996, a proportional increase of 46 percent. For 12th graders, smoking rates increased from a low of 27.8 percent in 1992 to 36.5 percent in 1997, a proportional increase of 31 percent.

What factors could have been acting to erase two decades of progress in reducing teen smoking rates? Throughout this period, smoking by adults declined slightly (from 25.7 percent in 1991 to 24.7 percent in 1997); so increased adult role modeling could not be responsible for increased teen smoking. The average retail cost of a pack of cigarettes increased from 132.5 cents in 1991 to 163.4

cents in 1997; so the increase cannot be due to increased affordability.[75] Restrictions on smoking in public areas increased throughout this period as well. The only apparent cause of the increase in teen smoking would be the well-documented promotional activities of the tobacco companies targeted at children and adolescents.[76] The infamous Joe Camel cartoon advertising campaign began in 1988 and ended in August of 1997. In addition, billions of dollars were spent on the Marlboro Gear and Camel Cash promotional campaigns during the early 1990s. According to the Federal Trade Commission, tobacco industry spending on advertising and promotions increased in every year but one, from 1987 to 1998.[77]

Among high school seniors, 30-day smoking prevalence declined from a peak of 36.5 percent in the class of 1997 to 29.5 percent in the class of 2001, a proportional decline of 19 percent. The past 30-day prevalence for smokeless tobacco use peaked in 1995 at 12.2 percent among high school seniors.[74] It has subsequently declined to 7.8 percent among the class of 2001, a proportional decline of 36 percent. Current teen smoking rates are nearly back to their baseline prior to the epidemic increases of the 1990s. Success has a thousand fathers, and the causes for the recent down turn in tobacco use among adolescents may be due to a variety of interventions, among these are price increases, increased enforcement of underage sales laws, the elimination of Joe Camel, stricter school smoking policies, bans on smoking in other public places, and state and national anti-tobacco media campaigns.

PUBLIC HEALTH APPROACHES TO PREVENTING TOBACCO USE, RESTRICTING TOBACCO INDUSTRY ACCESS TO YOUTH, AND YOUTH ACCESS TO TOBACCO

Restricting the Promotion of Tobacco Products

Attempts to ban tobacco advertising in the United States have run afoul of the Supreme Court's new interpretation of the First Amendment. Prior courts having ruled that commercial speech could be banned if the government provided a compelling justification in terms of the public good.[78] However, a more conservative Supreme Court has recently reversed this legal precedent by placing the First Amendment value of cigarette advertising above the value of protecting the public from the promotion of a product that is responsible for 20 percent of all deaths in the United States.[79] This decision places the US Supreme Court's interpretation of freedom of speech at odds with those operating in the vast majority of constitutional democracies in the free world. In 2002, the European Parliament approved a total ban on tobacco advertising in the European Economic Community. Tobacco continues to be heavily advertised in parts of Eastern Europe, Latin America, Asia, and Africa.

As a condition of settling liability litigation with the states, the tobacco manufacturers agreed to limited voluntary restrictions on their promotional activities. They agreed not to use cartoon characters in their advertisements, to eliminate billboard advertising, to forgo placing their brand names on other articles such as clothing, and to avoid targeting children and adolescents. The settlement agreement left tobacco companies with many avenues to continue their decades-long effort of recruiting youth. Children continue to be targeted by the psychological appeals of print ads.[80] Tobacco advertisements plaster most convenience stores as a result of the billions spent on promotions at point of sale outlets. Motor sports sponsored by tobacco companies are widely televised to young audiences. In addition, some tobacco companies are already violating the MSA; a California court recently found RJR Nabisco guilty of targeting youth through the selective placement of their ads in magazines with high youth readership.[81]

While dozens of studies have identified exposure to tobacco advertising as a strong risk

factor for the uptake of tobacco use by youth, it has been difficult to document the benefits of imposed bans on advertising. Given the seemingly unlimited resources available to the tobacco companies, a partial ban on advertising may have little impact.[82] As one channel of communication is shut down, the tobacco companies quickly redirect their resources to other channels. For example, when broadcast advertising of cigarettes was banned, there was an explosion in the number of cigarette ads in print media. In countries with complete advertising bans, the cigarette companies ran ads for tours of "Marlboro Country" and advertised Camel boots with ads that are only distinguishable from the original cigarette ads in the fine print. These violations of the spirit of the law undercut the effectiveness of the intervention. By sabotaging efforts to restrict the promotion of tobacco products, tobacco companies deny public health officials the evidence they need to justify such restrictions in front of a US Supreme Court that is hostile toward government regulation.[78]

Curtailing Retail Tobacco Sales to Children

Surveys of established adolescent smokers reveal that retail stores are their primary source of tobacco.[83,84] The first serious attempt to prevent the sale of tobacco to minors occurred in 1990 in Woodridge, IL.[85] Strict enforcement of a village ordinance prohibiting the sale of tobacco to minors and the possession of tobacco by minors resulted in a 50% reduction in the proportion of youth who smoked. This dramatic reduction in tobacco use has been sustained over many years.[86] Positive results from youth access law enforcement in terms of the proportion of youths who smoke has been demonstrated by several authors.[87-91] Additional studies have demonstrated that smoking rates are lower in communities or states with stronger laws restricting the sale of tobacco to minors.[92-94] Some attempts to reduce youth access to tobacco have been unsuccessful at reducing youth tobacco use because of lack of cooperation by tobacco merchants.[95,96] In one study, while merchants uniformly refused to sell tobacco to underage decoys, 100 percent of the young smokers in those communities reported that they purchased tobacco from local shops.[96] This indicates that merchants can avoid prosecution and undermine the effectiveness of the law as a prevention tool by selling only to youths with whom they are familiar.

Following the experience of Woodridge, IL, the federal government enacted a requirement that all states enact and enforce laws to prevent the sale of tobacco to minors.[97] Ten years later, some states have made exemplary progress, while many have been quite ineffectual.[98] A recent review blamed the poor performance of many states on their failure to devote adequate resources to enforcement.[99] Cost should not be a barrier to enforcement; a model program could be generously funded with a tax of only one or two cents per pack of cigarettes.[98] Enforcement programs are very cost effective in comparison to other preventive measures. For example, the cost of the Woodridge, IL, enforcement program has been calculated at just $45 per year of life saved, making it more than 1,000 times more cost effective than mammography, which has a price tag of $47,000 per year of life saved.[98,100]

Local authorities will frequently ignore youth access laws unless they hear from the community that there is support for enforcement. This is an area where a local physician can make a big difference by advocating for strict enforcement of tobacco sales laws within his or her community.

Possession Laws

There is ongoing debate among tobacco control professionals as to whether laws that prohibit possession of tobacco are a good strategy. Such laws have been promoted by lobbyists for the tobacco retailers and

manufacturers, and can provide them with liability protection in lawsuits brought on behalf of minors. Possession laws can also hamper efforts to monitor retailer compliance with restrictions on underage tobacco sales. There is also concern that enforcement efforts will penalize youth while ignoring the responsibility of retailers who heavily promote tobacco and illegally sell it to children.[101]

On the other side of the debate there are arguments that possession laws reinforce the health message that tobacco is a dangerous substance.[102] These laws can prevent groups of youth from congregating on the sidewalk in front of school property to smoke. Possession laws may act as a deterrent to some youth who are uncommitted to smoking.

Very little research has been done on this issue. Langer, et al. reported that nearly half of teens cited to appear in a teen tobacco court for smoking said they were either smoking less or stopping altogether.[103] Jason, et al. found that a combination of strong enforcement measures taken against merchants coupled with enforcement of a tobacco possession law was more effective than moderate enforcement against merchants alone in reducing adolescent smoking.[90] Research results presented at a recent national meeting indicate that additional studies demonstrating a positive impact of possession laws will be published soon.

Taxes

Raising the price of cigarettes reduces tobacco consumption by youth.[94] Public health organizations have pushed to raise the price of tobacco products through aggressive taxation and by using product liability litigation to force the tobacco companies to bear some of the financial burden for the treatment of diseases caused by their products.[104] The Coalition on Smoking OR Health, A Public Policy Project with the National Interagency Council on Smoking and Health, has estimated that a two dollar per pack increase in the tax on cigarettes "would prevent roughly two million premature deaths over time by discouraging young people from beginning to smoke and by encouraging some current smokers to quit."[105] Physician input on the health consequences of smoking and the costs these impose on states is often key to the passage of higher taxes.

CHANGING THE SOCIAL NORM TO SUPPORT A DECISION NOT TO SMOKE

School Smoking Policies

Several policy approaches are based on a strategy of restricting opportunities for children to use tobacco and changing social norms about the normality and acceptability of tobacco use. Several studies have demonstrated that the prevalence of tobacco use is lower in schools that adopt policies to prohibit smoking and strictly enforce such policies.[106-109] In one study, smoking rates were reduced by about 40 percent by strict enforcement of a no-smoking policy.[106] This is another area of policy that can be easily advocated by a single physician or group of physicians within a community.

Smoking Restrictions

A household ban on smoking sends a message that smoking is unhealthy both for the smoker and the family. Household smoking bans are associated with a decreased risk of adolescent smoking.[12,108] Bans inconvenience adolescent smokers and facilitate cessation. It is difficult for adolescents to quit while their parents smoke in front of them. Practicing physicians can advise their adult patients to adopt household non-smoking policies to discourage adolescent smoking. Restrictions on smoking in public places have also been associated with a lower prevalence of smoking among adolescents.[108]

TABLE **2**

Suggested Questions to Assess Risk for Taking Up Smoking

Risk Factor	Questions
Friend smoking	1) Do any of your friends smoke? (yes/no)
Parent smoking	2) Do your parents smoke? (yes/no)
Media supervision	3) Are you allowed to watch R-rated movies? (yes/no)
Anti-smoking socialization	4) Have your parents discussed rules about smoking? (yes/no) 5) Would your parents be upset if you smoked? (yes/no) 6) If you tried smoking do you think you would be caught? (yes/no) 7) Have your parents ever congratulated you for remaining smoke free? (yes/no)
School performance	8) How are your grades in school? (Excellent, average, below average)
Attitudinal susceptibility (must answer "definitely not" to both to be not susceptible)	9) Do you think you might smoke in the next year? (Definitely not, probably not, probably, definitely) 10) If your friend offered you a cigarette, would you smoke it? (Definitely not, probably not, probably, definitely)

Health Education

A review of the literature on school smoking prevention programs is beyond the scope of this article. Health education programs can be effective in producing a modest reduction in the uptake of tobacco use, but usually require an intensive multicomponent anti-smoking curriculum.[52] Further research is needed to test for synergistic effects by reinforcing the health education message with strict enforcement of school tobacco policies and strict enforcement of tobacco sale and possession laws. Each of these approaches has only been evaluated in isolation from the others.

PREVENTING TOBACCO USE IN PRACTICE

Based on some of the more important predictors of adolescent smoking, the practitioner can develop a risk profile from responses to 10 questions (Table 2). Positive responses to any of the first three questions relate to exposure to three important social influences on smoking. The next four relate to parenting around tobacco use. Question eight relates to school function and the final two questions determine attitudinal susceptibility. Answers to the questions also point out where the clinician might spend time in order to enhance prevention. The *Patient Pages* in this issue (page 124) cover most of the areas parents could address, and the clinician could circle areas to emphasize based on the clinical assessment.

Unfortunately, there is little direct evidence in the form of randomized clinical trials to support prevention activities in the clinical setting. The Guide to Clinical Preventive Services gives an "A" rating to including anti-tobacco messages in health promotion counseling of children and adolescents, but admits that there is no study that evaluates the effectiveness of clinical counseling to prevent

the initiation of tobacco use (clinical counseling gets only a "C" rating). It follows that, rather than spending large amounts of time engaging in direct counseling, the practitioner should develop or acquire materials to give to parents at each visit, and focus on areas that give positive results in the screening questionnaire. The materials should be dispensed with brief advice, and should be designed to prompt a discussion between the parent and the child (e.g., around expectations regarding tobacco use) or to motivate a behavior change (e.g., to motivate a parent to limit exposure to R-rated movies in young children).

SMOKING CESSATION COUNSELING FOR ADOLESCENTS

The Tobacco Consortium of the American Academy of Pediatrics Center for Child Health Research has prepared a thorough review of office-based interventions for tobacco counseling.[110] Readers are referred to this publication for an in-depth review. One of the group's conclusions is that "evidence-based practice guidelines for treating nicotine dependence in youth are not yet available." Current practice guidelines are based on expert opinion rather than clinical efficacy trials. With the current state of evidence, it is easier to tell physicians what not to do.

• Do not assume that adolescent smokers have no interest in quitting. Data from six surveys show that 71 to 83 percent of adolescent smokers had already experienced an unsuccessful attempt at cessation.[111-116] This indicates that an interest in quitting is quite common.

• Do not assume that a youth who is smoking only an occasional cigarette cannot be hooked. Reflecting the early onset of dependence, Stone and Kristeller found that 80 percent of adolescent occasional smokers wanted to quit.[117] Many youths who are not yet smoking daily are hooked and find quitting to be a challenge.

• Do not assume that young smokers understand anything about nicotine dependence or the nature of nicotine withdrawal. It may be helpful to counsel them as to the nature of nicotine withdrawal and how they can cope with symptoms such as craving.

• Do not assume that youth know how to formulate a smoking cessation strategy; they need your help.

• Do not assume that smoking cessation is easier for youth who are light smokers than it is for adult heavy smokers. There is no evidence that this is true. Although cessation efforts often begin before the onset of daily smoking, it takes the average adolescent smoker 18 years to successfully complete cessation.[118] The neurophysiological changes brought on by smoking are more pronounced and more prolonged in adolescent animals than among adult animals.[67] Many cessation techniques that have worked with adult patients have had only limited success with adolescents.[119]

Until more is known about how to help adolescents break their dependence on nicotine, it is recommended that physicians follow the five A's approach to cessation counseling recommended for adults: ask about tobacco use; advise all tobacco users to stop; assess their willingness to quit; assist the patient in formulating a quit plan; and arrange for follow-up to assess the need for further advice and encouragement (Table 3).[120] Many young smokers develop symptoms of nicotine dependence before they realize that they are hooked.[121] A potential use for the HONC is as a self-assessment tool within the office setting (Available at: http://www.umassmed.edu/fmch/research/publications/). It is hoped that the HONC will alert young smokers that they are already experiencing symptoms of dependence, and that this might stimulate

TABLE **3**

The Five A's of Smoking Cessation Counseling

ASK all patients if they have used tobacco.	Example: "Have you ever used tobacco?"
ADVISE the patient to stop using tobacco. It helps to personalize the risk.	"I advise all my patients to quit smoking because tobacco kills half of the people who use it. I know that your grandfather has emphysema. If you continue to smoke there is a good chance the same thing will happen to you."
ASSESS willingness to quit.	"Have you ever tried to stop smoking? Have you thought about quitting?" If the patient is unwilling to quit now, tell him or her to think about quitting and that you will bring it up again at the next visit.
ASSIST the patient in formulating a personal quit strategy.	"What do you think will be the hardest thing about quitting?" Help the patient to develop a strategy to overcome his or her personal hurdles.
ARRANGE for follow-up.	"Nicotine addiction is a serious medical problem, I would like to see you back in a few weeks to see if you are successful with your plan to quit and to offer you more help if you are not successful."

youth to attempt cessation earlier, when success is more likely.[112,122,123] The efficacy of this strategy has not yet been evaluated.

BEYOND THE OFFICE: THE ROLE OF THE CLINICIAN IN TOBACCO CONTROL

Physicians play a prominent role within their communities. Their voice can influence the behavior of a local vender or sway a city council debate. Recently, the city of Keene, NH, adopted a restaurant smoking ban. The local ordinance was supported by a vocal group of physicians from the community medical center, and a dozen of these physicians were present at the city council debate on the ordinance. As is typically seen, the restaurant association, supported by the tobacco industry, came out against the ban, saying it would hurt business. The physicians spoke out in favor of the ban because of the damaging effects of environmental smoke on health. In an interview after the vote, one councilman said, "I wasn't about to vote against the ordinance with all those doctors in the room." Table 4 lists some actions physicians can take to contribute to public health efforts that protect children and adolescents from tobacco.

TABLE **4**

Community Activities for Physicians

Encourage local officials to adopt and strictly enforce a ban on the use of all tobacco products on school property.
Encourage local officials to adopt and strictly enforce a ban on the sale of tobacco products to minors.
Support efforts to protect children and adults from the hazards of environmental tobacco smoke by eliminating smoking in all public places.
Support local, state, and federal excise tax increases on all tobacco products to discourage youths from using them.
Encourage local vendors not to display tobacco advertising and not to sell to minors.

Interested physicians can find out more about tobacco control in their communities, states, nationally, and internationally by accessing the Web sites listed in Table 5. CA

TABLE 5

Tobacco Control Resources on the Internet

Web address	Topic
Advocacy groups and organizations	
http://www.bcm.tmc.edu/doc/#whatisdoc http://www.kickbutt.org/about.html	Doctors Ought to Care DOC was founded by a family physician, and has been involving physicians in youth tobacco prevention for over two decades.
http://ash.org/ http://www.ash.org.uk/	Action on Smoking and Health (ASH) ASH is the nation's oldest and largest anti-smoking organization. The Web site acts as an information clearinghouse and provides nonsmokers with legal forms and valuable information to help them protect their rights, and to learn more about the problems and costs of smoking to nonsmokers.
http://smokefreemovies.ucsf.edu	Smoke-Free Movies Get involved in the movement to pressure Hollywood to stop glamorizing smoking in movies.
http://www.tobacco-control.org/tcrc_Web_Site/Pages_tcrc/Resources/tcrc_Publications/Publications_Other_Languages/English/English_DT_Publication-Main_Page.htm	British Medical Association This Web site details how physicians can contribute to fighting tobacco and includes international news.
http://www.tobaccofree.org/	Tobaccofree.org Site supported by the Foundation for a Smoke-Free America and dedicated to helping smokers quit and helping kids stay tobacco free.
http://www.tobaccofreekids.org/	National Center for Tobacco-Free Kids An advocacy center sponsored by the Robert Wood Johnson Foundation and devoted to keeping kids tobacco free.
http://www.no-smoke.org/	America for Nonsmokers' Rights This Web site contains definitive information about how to draw up a local ordinance and get it passed.
News about tobacco control	
http://www.tobacco.org/	All the news about tobacco and tobacco control.
Structured reviews, medical journal articles	
http://www.update-software.com/ccweb/cochrane/revabstr/g160index.htm	Cochrane reviews on tobacco interventions.
http://bmj.com/cgi/collection/smoking	*British Medical Journal* smoking collection: dozens of important articles on smoking published in *BMJ*.
Resources to help people quit smoking	
http://www.lungusa.org/tobacco/ http://www.quitnet.com/	American Lung Association cessation site. Quitnet cessation site.
Resources for kids	
http://www.considerthisusa.net	Consider This Interactive anti-tobacco curriculum developed for junior high school students and tested in Colorado schools.
http://www.cigarettelitter.org/index.asp?PageName=Home	CigaretteLitter.org CigaretteLitter.org is an informal, non-profit organization dedicated to dramatically reducing cigarette litter across the United States.
http://www.joechemo.org/	Joe Chemo Joe Chemo now has his own Web site. JoeChemo.org is an interactive Web site that allows visitors to test their "Tobacco IQ," get a personalized "Smoke-o-Scope," and send free Joe Chemo E-Cards. There is also extensive information for teachers, anti-smoking activists, health care providers, journalists, and smokers who wish to quit.
http://www.getoutraged.com/	Get Outraged Sponsored by the Massachusetts Tobacco Control Program, this site includes information from formerly secret tobacco industry documents as well as suggestions for how to get involved in the fight against the tobacco industry.

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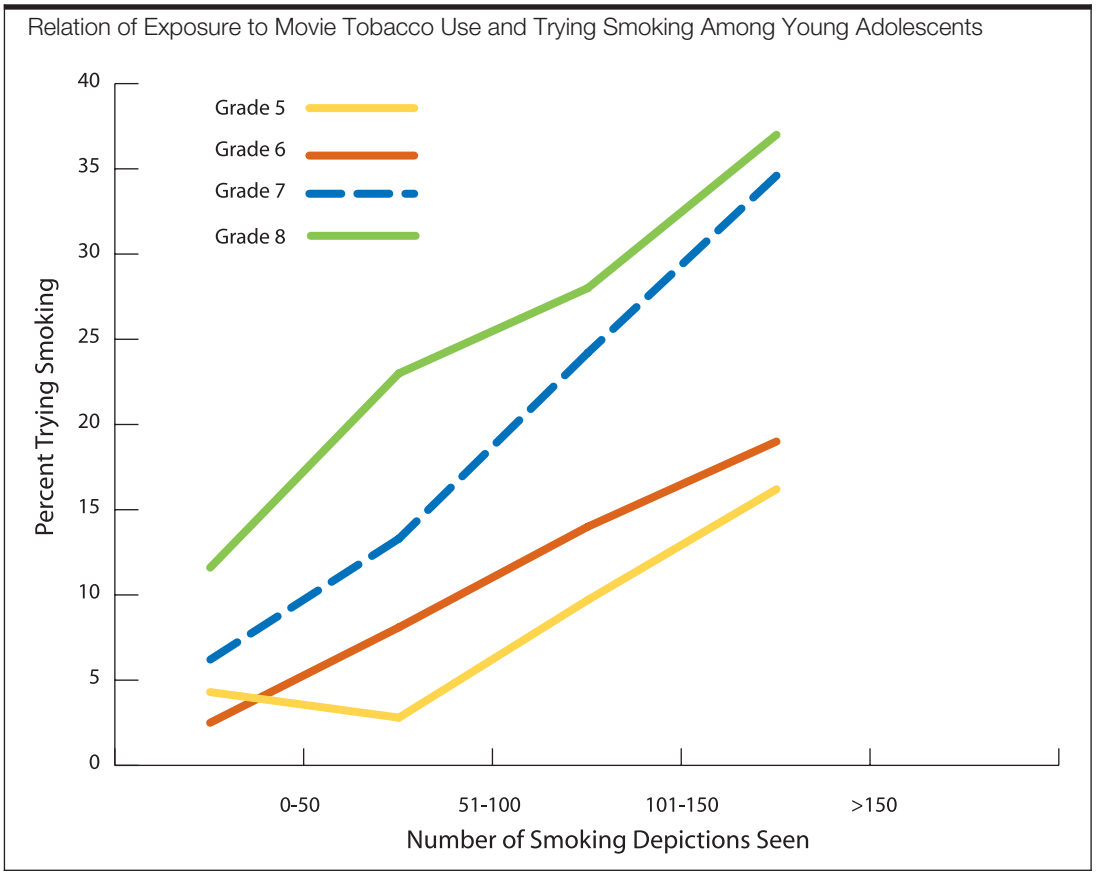
Errata

In the March/April 2003 issue, in the article "Tobacco Control for Clinicians Who Treat Adolescents" (Sargent JD, DiFranza JR. *CA Cancer J Clin 2003:53;102–123*), an error appeared in Figure 4 (page 108). The corrected figure is reproduced here.

We apologize for the error and any confusion it may have caused.

FIGURE 1



Note: Exposure is categorized by the number of tobacco occurrences the adolescent was exposed to from a sample of 50 contemporary movie titles.