Tobacco Use by Adolescents: The Role of the Oral Health Professional in Evidence-based Cessation Programs

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Abstract

The use of tobacco products, especially cigarette smoking, represents the leading cause of preventable illness and death in the developed world. In the United States, major gains have been made to reduce smoking among adults. Similar gains, however, have not been realized with adolescents. In recent years, substantial interest has been directed to tobacco cessation studies with adolescents. The previously limited interest in adolescent cessation programs was attributable in large part to the mistaken assumptions that: (1) adolescent tobacco users were not dependent on nicotine and could stop at any time; (2) adolescents did not want to quit; and (3) adult tobacco cessation programs would be effective with adolescents. The need for programs to increase adolescent cessation attempts is underscored by the Healthy People 2010 goal that calls for an increase in tobacco use cessation attempts by adolescent smokers to 84%. Dental providers need to take steps to prevent tobacco use by adolescent patients. For those who are already addicted, they need to provide cessation counseling services or referral for appropriate treatment.

The purpose of this paper was to provide dental clinicians with information on: (1) tobacco and health; (2) the epidemiology of adolescent tobacco use; and (3) tobacco cessation programs for parents and adolescents that can be implemented in the dental office setting. (Pediatr Dent 2006;28:177-187)

KEYWORDS: TOBACCO CESSATION, TOBACCO COUNSELING, ADOLESCENT SMOKING, NICOTINE DEPENDENCE, TOBACCO RELATED DISEASE

The use of tobacco products, especially cigarette smoking, represents the leading cause of preventable illness and death in the developed world.[1] In the United States, major gains have been made to reduce smoking among adults. Similar gains, however, have not been realized with adolescents. Every year, up to 1 million teenagers become smokers, making cigarettes the most frequently used addictive substance among high school students.[2] During adolescence, individuals tend to experiment with harmful substances that include tobacco and alcohol, and from this early experimentation there is an increased chance that a lifetime of dependence will happen. Children can become addicted to tobacco after only a few cigarettes.[3] Tobacco is one of the first drugs used by adolescents prior to experimenting with marijuana or other drugs.[4] Exposure to smoking by peers and parents and through television and the movies are social influences that contribute to adolescent smoking behavior. Seventy percent of middle school students and 57% of high school students who use cigarettes live in households with smokers.[5]

Since first use of tobacco usually begins in adolescence, it is important that steps are taken to dissuade the adolescent population from initially trying tobacco products and from subsequently developing a lifetime of addiction to nicotine. If middle and high school students can be advised not to commence tobacco use, there is an increased chance they will never use tobacco and will remain free of tobacco for life. Children should be screened for smoking risk factors starting at age 10. In addition, parents should be encouraged to quit smoking. If they cannot quit, they should be encouraged to: (1) not smoke around their children; (2) establish smoke-free homes; and (3) monitor their adolescents for smoking signs.[6] Furthermore, adolescents who use tobacco should be assessed for signs of nicotine dependence.

Dental clinicians can play an important role in addressing tobacco use and cessation with their adult and adolescent patients. Tobacco use has oral effects that are clearly visible, such as stained teeth and gingival lesions, and their presence can provide dental clinicians with an ideal opportunity to begin a discussion with their patients about tobacco use and cessation. Dental providers should take steps to prevent tobacco use by adolescent patients, and for those who are already addicted, they should provide cessation counseling services or referral for appropriate treatment.

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2. the epidemiology of adolescent tobacco use; and
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Tobacco and health

Tobacco's deleterious health effects include its causal relationship with a number of cancers, cardiovascular diseases, respiratory diseases, and reproductive complications.[7] Cigarette smoking during adolescence reduces the rate of lung growth and the level of maximum lung function. Exposure to secondhand smoke can also hinder the growth of the lungs and may increase the risk of developing lung cancer as an adult.[8] Adolescent smokers' fitness levels are inversely related to the duration and intensity of smoking. It is common for adolescent smokers to report that they experience shortness of breath, coughing spells, phlegm production, wheezing, and overall diminished physical health.

Cigarette smoking during childhood and adolescence poses a risk for respiratory symptoms and problems during adolescence. These health problems are risk factors for chronic conditions in adulthood, including chronic obstructive pulmonary disease.[4] Smoking by children and adolescents is also associated with an increased risk for early atherosclerotic lesions and increased risk factors for cardiovascular diseases. A continuation of smoking beyond adolescence into adulthood significantly increases the risk for early development of cardiovascular disease.[4]

Among men 35 to 69 years old in industrialized countries, smoking is responsible for approximately 40% to 45% of all cancer deaths and for approximately 85% of oral cancer deaths.[9] In 2002, 10.8 persons per 100,000 population were diagnosed with oral or pharyngeal cancer in the United States.[10] Overall in the United States, an estimated 27,000 new cases and 7,200 deaths were expected to occur from oral cancer in 2003.[7] Oral and pharyngeal cancers include malignancy of the buccal mucosa, lip, floor of mouth, tongue, palate, gingival, or oropharynx and account for up to 2% of cancers diagnosed in the United States annually.[11] Studies provide consistent evidence that cigarette smokers are at an increased risk of being diagnosed with and dying from oral and pharyngeal cancers than lifetime nonsmokers.[7] Oral cancer has a low incidence in children (see Table 1), however, diagnosis of oral cancer in younger patients results in decreased survival rates.[12,13] A combination of factors, such as the toxic chemicals present in tobacco and the exposure of the mucosal tissues to heat from smoking, contribute to adverse changes in the oral tissues. The manifestation of cancer reflects an accumulation of many years of exposure to the carcinogenic effects of tobacco that, in part, explains the increased incidence of oral and pharyngeal cancer observed with age. Studies have identified early initiation of smoking as an independent risk factor for lung cancer. More recently, it has been purported that there is an age-related susceptibility for the oral cavity.[14-17] Oral cancer risks and the risk for other complications caused by tobacco use decline with the number of years of abstinence.[18]

Chronic smoking can lead to increased prevalence and severity of periodontal disease, contributing to the loss of teeth. Studies have calculated that a substantial percentage of the variance of periodontitis in the population (as high as 50%) can be attributed to smoking alone.[19-21] Longitudinal studies of both treated and untreated periodontitis have shown higher progression of attachment loss or bone loss in smokers than nonsmokers.[22] A dose-response relationship between exposure to smoking, measured in pack years, and extent and severity of progressive periodontitis has been demonstrated as well. It is the primary reason for loss of teeth among 19- to 40-year-olds.[23] Nonsmokers respond better to periodontal therapy than smokers.[24]

Smokeless tobacco use is often mistakenly regarded as a safe alternative to cigarette smoking, particularly among teenagers. The health risk associated with smokeless tobacco use is high,[18] and it is believed that the use of smokeless tobacco may increase the risk of taking up smoking.[25,26]

Smokeless tobacco use is associated with:

1. loss of taste;
2. periodontal disease;
3. stained teeth;

Table 1. Oral and Pharyngeal Cancer Incidence and Death Rates in the United States, 1998-2002*[10]

	Incident Rates				Death Rates		
Age at diagnosis	Total	Male	Female	Age at death	Total	Male	Female
10-14	.3	–	–	10-14	–	–	–
15-19	.4	–	–	15-19	.0	.1	–
20-24	.6	–	.8	20-24	.1	.1	.1
25-29	1.3	1.2	1.4	25-29	.1	.1	.1
30-34	1.6	1.7	1.6	30-34	.2	.2	.1
35-39	3.1	4.0	2.1	35-39	.4	.5	.3
40-44	6.4	9.0	3.9	40-44	.9	1.3	.5
45-49	12.3	18.7	6.1	45-49	2.1	3.4	.9
50-54	18.6	28.5	9.2	50-54	3.6	5.8	1.5
55-59	24.9	37.4	13.0	55-59	6.0	9.7	2.6
60-64	32.2	48.5	17.2	60-64	8.1	12.9	3.7

*Rates are per 100,000 and are adjusted to the 2000 US standard population.

4. altered sense of smell;
5. intraoral lesions;
6. gum recession that results in exposed roots and increased sensitivity to heat and cold;
7. drifting and tooth loss from damage to gingival tissue;
8. abrasion to tooth enamel due to high levels of sand and grit contained in smokeless tobaccos;
9. tooth discoloration; and
10. oral malodor.[27,28]

In addition, most smokeless tobaccos contain substantial quantities of nicotine, leading to a pattern of addiction similar to cigarette smoking.[29] Smokeless tobacco increases the risk for oral, pharyngeal, and esophageal cancer. In the last 3 decades, there has been a major increase in the sale of moist snuff in the United States, with an increase in use among adolescent and young males.[30] Moist snuff contains a considerable amount of carcinogenic tobacco agents.[31] A survey of schoolchildren 12 to 17 years old found premalignant lesions in the oral cavity of 2.9% of male students and less than 0.1% of females.[32] The risk of cancer in oral soft tissues is almost 50 times greater in long-term smokeless tobacco users than nonusers.[33]This finding was significantly related to the use of chewing tobacco and snuff as an adolescent.[32]

In recent years, an increased availability of flavored tobacco products in the United States has been observed. These products are marketed to young people and are often "advertised" as being safer than conventional cigarettes, which may increase the adolescent's risk of continuing unsafe health behaviors.[34] The 1999 National Youth Tobacco Survey (NYTS) identified the use of flavored tobacco products as a particular problem among minority children.[35] The number of US students who use bidis (cigarettes imported from India that have a sweet flavor added) and Kreteks (sometimes referred to as "clove cigarettes") has dramatically increased and reached almost the same proportions of those who use smokeless tobacco. The NYTS reported that bidis were used regularly by 5% of high school adolescents and 2.4% of adolescents in middle school, while the prevalence of Kretek use was reported as 6% by high school adolescents and 2% of adolescents in middle school.[35] These alternative tobacco products actually have much higher phenol, hydrogen cyanide, and benzopyrene content than conventional cigarettes.[34,36] Bidis usually do not carry the Surgeon General's warning on tobacco use health hazards.[37] Cigarettes remain the most widely used tobacco product by youth. Recent trends, however, underscore the importance of monitoring the rates at which minority youth adopt other tobacco products.

Publicity campaigns, media exposure in movies and music videos, and the increase in the number of athletes who publicly use cigars has resulted in cigar smoking now being seen by many as an alternative to cigarette smoking. Occasional cigar smoking may pose serious health risks. It increases the risk for periodontal disease, which can lead to tooth and alveolar bone loss.[37] Cigar smokers also suffer from excessive tooth stain and chronic halitosis.[38] Risk of lung cancer and heart disease may be the same as that of cigarette smokers , but only for heavy users and those who inhale.[39]

Epidemiology of tobacco use in adolescents

In 2003, approximately 20% of US adults were identified as current smokers.[40] The majority of current tobacco users reported that they started tobacco use during adolescence. Thirty-one percent indicated that they started regularly before they were 16 years old, 24% between 16 and 17 years old, and 26% between 17 and 18 years old.[41] In recent years (1997-2003), the Monitoring the Future Survey reported a decline in current tobacco use among high school students.[42] A small increase in adolescent tobacco use, however, was noted in 2004 (see Figure 1). Current 30-day prevalence (any use in the past 30 days) is 9.2% for eighth graders, 16% for 10th graders, and 25% for 12th graders. Current daily use in the past 30 days is 4.4% for eighth graders, over 8% for 10th graders, and nearly 16% for 12th graders.[42]

The gender difference is not significant, with similar numbers of male and female students reporting current cigarette use (defined as any tobacco use in the past month) in 2003 (see Figure 2).[41-43] The prevalence of current frequent smoking (defined as daily use of tobacco) in the last

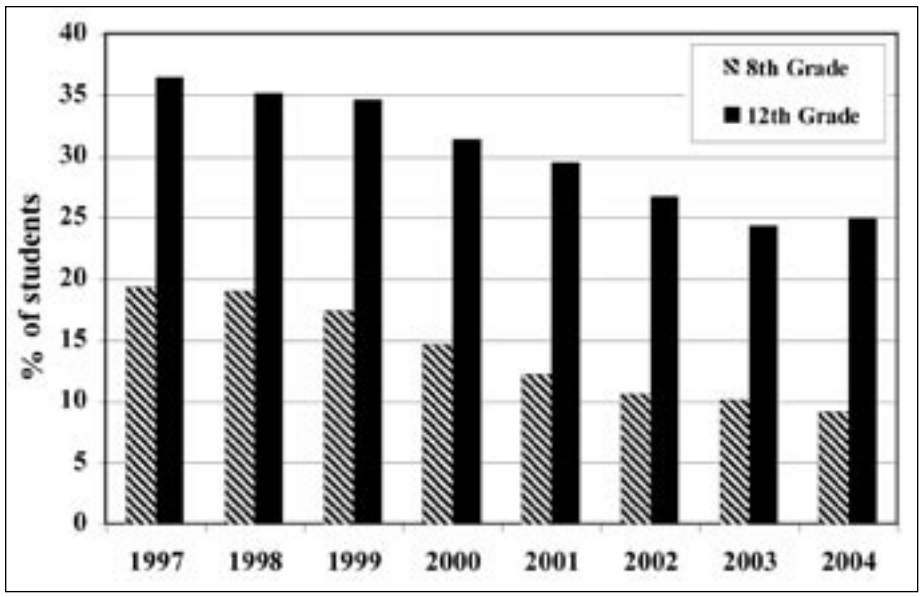

Figure 1. Trends in 30-day prevalence of cigarette use for eighth and 12th graders, United States, 1997-2004.[42]

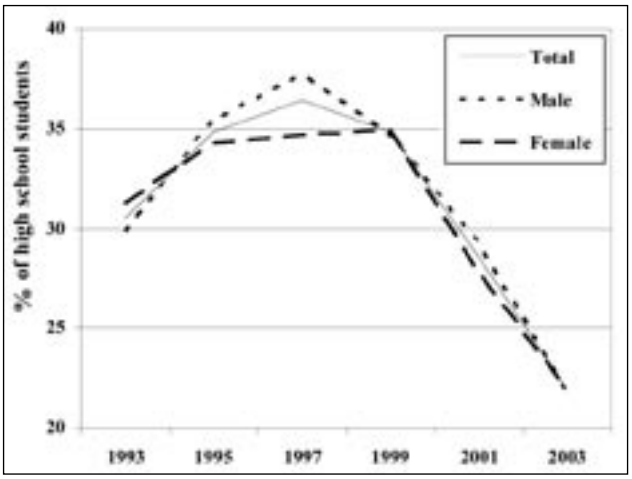

Figure 2. Current cigarette smoking among high school students by gender, United States, 1993-2003.[41]

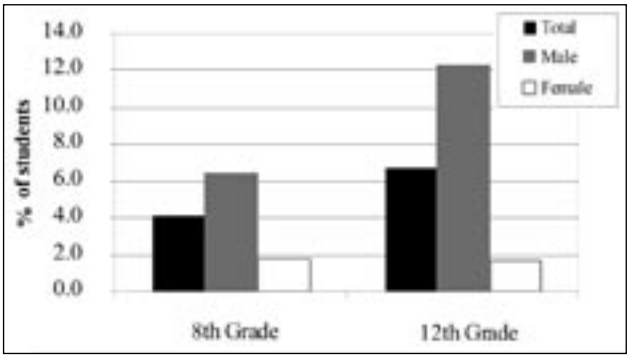

Figure 3. Thirty-day prevalence of smokeless tobacco use in eighth and 12th grades, United States, 2004.[42]

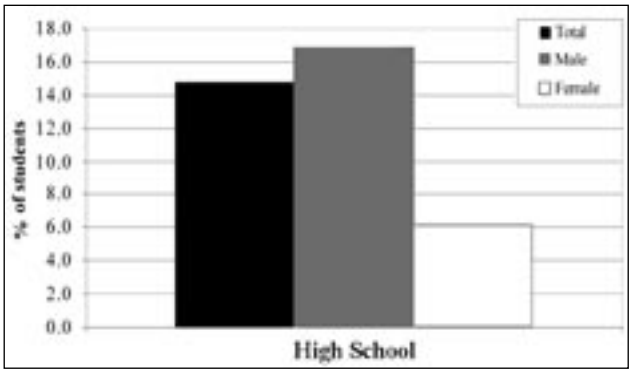

Figure 4. Monthly Cigar Use among High School Students, United States, 2002.[44]

month is higher among 12- to 17-year-old females (14%) than males (13%), and there has been a recent increase in smoking among young girls.[42] Non-Hispanic Caucasian students (25%) reported greater current use when compared to African American (15%) and Hispanic (18%) students.[41,45] If the current tobacco use patterns continue in the United States, approximately 6 million youth under 18 years of age can expect to die prematurely from a smoking-related disease.[46]

Recent national surveys show that, among middle school students, 4.2% of boys and 1.3% of girls reported current use of smokeless tobacco. In the 12th grade, 12.2% of male students and 1.6% of female students reported smokeless tobacco use (see Figure 3).[35] These reported percentages of smokeless tobacco use represent a general increase in prevalence since the 1990s , with a leveling off in recent years.[35,42]

The gender difference for smokeless tobacco use is pronounced, with few female students reporting smokeless tobacco use. Smokeless tobacco use is reported by Caucasians more often than for African Americans or Hispanics.

An estimated 14.8% of students in high school (grades 9-12) reported monthly use of cigars in 2002. 16.9% of males reported use of cigars, while 6.2% of females reported using cigars on a monthly basis in 2002 (see Figure 4). For middle school students (grades 6-8), 7.9% of males and 4.1% of females reported current use of cigars (used cigars at least one day during the 30 days preceding the survey). In the 1990s use among adolescent males and females had been rising, with some rates exceeding adult rates.[35] The National Youth Tobacco Survey (2000 and 2002), reported a decline of current cigar use from 14.8% to 11.8%, for overall for high school students (grades 9-12), but no significant decline for middle school students.

In recent years, tobacco use by high school students has been declining as the result of multiple interventions, including:

1. efforts to enforce laws restricting the sale of tobacco to minors;
2. increasing the price of tobacco products;
3. the implementation/introduction of effective prevention programs such as the Truth Campaign; and
4. through smoke free public ordinances.[47-51]

Adolescent addiction

Youth tobacco use is associated with several risk factors, including:

1. parents who smoke;
2. friends who smoke (90% of young smokers indicate that a close friend also smokes)[5];
3. comorbid psychiatric disorders (anxiety, attention deficit disorder [ADD], substance abuse); and
4. weight concerns.[52-55]

ADD is associated with early initiation of cigarette smoking in children and adolescents.[53]

Tobacco addiction has been described as a cycle, with progression from experimentation to regular use, dependency, cessation, and relapse.[56] The transtheoretical model of change has been used to describe this cycle in adolescents.[57] This model consists of 6 cessation states, including:

1. recent tobacco introduction (<6 months);
2. precontemplation (not thinking about quitting);
3. contemplation (thinking about quitting);
4. preparation (made at least 1 quit attempt in past 6 months);

5. action (quit smoking); and
6. maintenance (successfully quit for >6 months).

The pattern of nicotine dependence among youth does not parallel the smoking uptake continuum observed for adult smokers.[58] Compared with adult smokers, adolescents are less likely to smoke daily or with regularity, and adolescent daily smokers smoke fewer cigarettes.[59] Among adults, dependence can require several months to a year. Findings suggest, however, that dependence occurs much more rapidly in adolescence. Among 12- to 13-year-old seventh grade students who had smoked at least once a month, 63% exhibited 1 or more symptoms of nicotine dependence.[4,58] Sixty-eight percent of adolescent smokers were considered dependent on nicotine, and at least 66% of smokers reported some form of withdrawal upon cutting down or quitting.[58,59] Adolescents also find it difficult to quit. Ninety-five percent of adolescent smokers indicated they plan to quit before graduation from high school, however, 75% will continue smoking.[6]

Tobacco cessation

Most adolescent tobacco cessation activities have been implemented in schools and in the community. Using behavioral and counseling techniques such as the social influence and life skills training methods, these programs have been found to have a short-term impact on smoking in youth. The results, however, weaken over time.[60,61] Therefore, alternative tobacco cessation intervention techniques should be considered when dealing with the adolescent population. The dental office is one alternative setting that should be considered for tobacco cessation program implementation. Strategies for tobacco cessation, conducted in the physician's or dentist's office, have been designed almost exclusively for adults. While they tend to be only brief interventions, they have been shown to be successful in obtaining harm reduction (a decrease in the amount of tobacco used) and in increasing quit attempts and successful tobacco cessation for the adult patient.

Brief dental office-based tobacco cessation intervention activities directed at adults also have been found to be effective in helping smokeless tobacco users quit.[62] Because children who live in a household with a smoker are more likely to start smoking, efforts should be made to make their home environment smoke free. If the dental clinician is effective in getting the parents or caregivers of adolescents to quit using tobacco, a concomitant reduction in the adolescent's experimentation with tobacco may also occur. Although clinical office-based tobacco cessation has been shown to be effective in many instances with adults, similar programs have been implemented on a very limited basis with adolescents.

Adolescents are difficult to recruit for formal cessation programs and, when enrolled, are difficult to retain in the programs. Interventions that focus on teaching youngsters skills to resist explicit or implicit peer pressure to continue smoking, as is done in many primary prevention programs, are expected to have limited effects. An alternative approach involves modification of their cognitions regarding smoking. Changing adolescents' thoughts and feelings about smoking prior to initiation and after they have started smoking and changing their perceived barriers regarding quitting might enhance the motivation to change their habits. The strong impact of smoking habits on adolescents' quitting behavior suggests that programs should incorporate methods that tackle the psychological and physiological dependence on nicotine among young people.[63,64]

There is limited evidence regarding tobacco cessation treatment for the adolescent tobacco user.[65] Efforts toward the formation of youth tobacco treatment guidelines were formalized with the formation of the Youth Tobacco Cessation Collaborative (YTCC) in 1998.[65,66] The YTCC is a collaboration of a number of public and private organizations committed to increasing discovery, development, and delivery of effective youth cessation strategies.[65] Although the YTCC guideline recommends different interventions and methods for delivering them, it does not provide recommendations for effective smoking interventions in the clinical setting.[67]

Tobacco cessation activities in the dental office

In recent years, organized dentistry has embraced tobacco cessation as a component of dental practice. Several nationally prominent dental journals, including the *Journal of the American Dental Association* (2001), and the *Journal of Dental Education* (2001) have featured tobacco cessation articles. In addition, the dental literature has published articles on the "5 As" (Ask, Advise, Assess, Assist, Arrange) as well as tobacco's link to periodontal disease and oral cancer. In New York, tobacco cessation training is now mandatory to obtain dental licensure.[68]

At least half of smokers visit a dentist every year, putting dentists in a good position to intervene with the tobacco-using parents or caregivers of an adolescent(s).[69-72] Dental treatment often necessitates frequent contact with patients over an extended period of time, providing a mechanism for long-term contact and reinforcement. In addition, the dental provider is in the unique position of being able to associate cessation advice with readily visible changes in oral status.

Dentists and dental hygienists are a largely untapped resource for providing advice and brief counseling to tobacco-using patients, and there are good reasons to believe that they can be effective in this role.[71,73] Brief interventions by dentists and physicians that involve simply advising patients to quit have been shown to have a small beneficial effect.[74,75]A somewhat more intensive intervention is more effective, however—about 10% to 15% of smokers are induced to abstain for at least a year.[62,76,77] Therefore, the dental office may be ideally suited to help patients quit smoking.

Despite this, however, tobacco cessation activities do not play a prominent role in dental practice. Albert et al reported that most dental practitioners surveyed were not

utilizing evidence-based approaches to reduce the use of tobacco products by their patients.[78] Surveys suggest that only approximately half of US dentists ask their patients about smoking on a frequent basis.[78-81] In addition, with fewer than 20% of dentists using an office-based smoker identification system[82] and fewer than 5% providing follow-up services to help patients quit,[83] it is clear that tobacco cessation advice provided within dental offices is sporadic and grossly inadequate. Surveys of dentists indicate that cessation activities are not yet a routine part of dental practice.[84,85]

In a survey of counseling activities among physicians and dentists, only 25% of dentists reported frequently or always offering preventive counseling for 16- to 18-year-olds and 18% for 13- to 15-year-olds, while 90% of pediatricians reported that they counseled 16- to 18-year-olds and 81% counseled 13- to 15-year-olds.[84] Shelley et al reported that 12% of adolescents who smoked in the past year indicated that they had received advice to quit from a dentist, while 20% provided preventive counseling.[86] Dentist counseling was found to be positively correlated with adolescent quit attempts.

Smoking Cessation for Adolescents

Persons who have smoked can discontinue at any stage, but quitting becomes more difficult as smokers progress through the continuum and become increasingly dependent on nicotine. The Teenage Attitudes and Practices Survey (1993)[87] established 5 baseline factors as significant predictors of quitting: (1) frequency of smoking; (2) length of past quit attempts; (3) self-estimation of likelihood of continuing smoking; (4) mother's smoking status; and (5) depressive symptoms. The more risk factors the adolescents had, the less likely they would succeed in quitting. The optimal public health strategy is therefore to prevent tobacco use completely or to intervene as early in the smoking behavior continuum as possible. Once adolescents have established a pattern of regular use, their behavior is usually driven by nicotine dependence as well as social factors. The incidence of lifetime-ever smoking among adolescents declined in the mid-1970s and early 1980s, but increased from 1991-1997, and then declined from 1997-2004 suggesting that this behavior is modifiable.

Pirie et al, in a follow up study of adolescents 2 years out of high school, found gender differences in smoking and quitting behavior, with young women more likely to be current smokers.[88] Although men in general tended to report more withdrawal symptoms, women were more likely to report weight gain and desire to eat more than men.[88]

Although approximately 70% of adolescent smokers regret ever starting, and 60% have made 1 or 2 attempts to quit, success rates have been low in the few cessation programs, designed for young persons, that have reported quit rates at follow-up.[5] There is a process of quitting, lapsing, and trying again before he or she can learn enough to overcome addition. A great deal of the attempts made by adolescents to quit may not be successful because adolescents tend not seek professional help; others have no access or knowledge of intervention services available.[66] According to Lantz and colleagues, a number of studies have found that many teenagers who smoke want to quit, but find that they are unable to do so.[89] They explain that it has been estimated that, "74% of occasional teen smokers and 65% of daily users have a desire to quit."[89] Despite these large numbers, adolescents are generally not interested in seeking help from any professional person or service when trying to quit, and they are especially concerned about confidentiality and do not want any parental involvement in their quit attempts.[89]

The low quit rates for adolescent smokers have lead to the consideration of multiple settings for tobacco cessation

Table 2. Strategies to Help Patients Willing to Quit Tobacco Use[69,92]

	The "5 As" for brief intervention	
	Parents	**Adolescents**
Ask about tobacco use	Identify and document tobacco use for every patient at every visit	Identify and document tobacco use and every visit
Advise to quit	Urge every tobacco user to quit in clear, strong, and personalized manner	Urge every tobacco user to quit in personalized manner
Assess willingness to quit	Is the tobacco user willing to make a quit attempt a this time? If not, attempt to get him or her to consider quitting	
Assist in quit attempt	Provide counseling and pharmacotherapy for patients interested in quitting	Aid in the development of a quit plan, and discuss with who information will be shared
Arrange follow-up	Schedule follow up visit to address successes, barriers, and the proper use and effectiveness of pharmacotherapy. It is preferable to schedule the first follow up visit within a few days of any cessation attempt.	Schedule follow up visit to address successes and provide encouragement. It is preferable to schedule the first follow up visit within a few days of any cessation attempt.
Anticipatory guidance		Discuss peer and family use, peer guidance responsibility, and short- and long-term health risks

interventions including the dental office. The clinical care setting is a potentially important and a mostly unexplored setting where youth tobacco cessation efforts can be successful at preventing initiation and promoting cessation. These interventions are potentially effective because nearly three-fourths of all adolescents see a dentist each year for routine preventive care.[70,90] Adolescent quit attempts are usually unsuccessful because adolescents are also addicted and will experience withdrawal symptoms with tobacco cessation. Two-thirds of adolescent smokers will experience withdrawal symptoms when trying to quit smoking.[59]

Sussman (2002) reviewed sixty-six tobacco cessation studies from 1975 to January 2001 for adolescents, including 13 in a medical or recovery clinical facility. These studies reported a mean quit rate of 12% at 3 to 12 months follow up. The mean quit rate for the control groups was 7%. The review found that interventions using motivation enhancement or contingency based reinforcement had higher quit rates, 19% and 17% respectively, than other intervention theories. However, it is important to note that Sussman found many methodological limitations, including small sample sizes, and single group design. It is therefore not possible to draw definitive conclusions from those studies.[91]

Although there is limited evidence from which to develop definitive guidelines, modifications to the Treating Tobacco Use and Dependence[69] guideline have been proposed to make them more appropriate for an adolescent population.[92] This USPHS guideline (2000) recommended counseling and behavioral interventions that have shown to be effective with adults should be considered for use with children and adolescents (see Table 2).

The "5 As"

In 1998, a Tobacco Use and Dependence Clinical Practice Guideline Panel was formed to develop an updated version of the 1994 Smoking Cessation Clinical Practice Guideline.[69] This updated guideline, Treating Tobacco Use and Dependence, is intended to identify assessments and treatments for tobacco dependence for the clinician. It is important that tobacco dependence be viewed as a chronic disease, with quit attempts commonly followed by phases of remission and relapse before permanent abstinence.[69]

The key recommendations made by this document can be summarized in 5 steps referred to as the "5 As" (see Table 2). Knowledge of the patient's tobacco use status allows the dentist to identify effective and appropriate interventions for the tobacco-using adolescent.[69] These guidelines can be effectively implemented in most populations and often require sessions as brief as 3 minutes.[69] The intervention can be used with adolescents who are current users willing to make a quit attempt.[69,92] The intervention should be personalized using the steps recommended and based on the adolescent's own needs. The proper management of the patient requires an understanding of when it is appropriate to utilize the "5 As" in practice and, alternatively, when a patient's tobacco addiction requires referral and treatment within a more comprehensive tobacco cessation center or to a telephone or Internet-based quit program.

A modification of the "5 As" program for adolescents has been proposed (see Table 2).[93] In the adolescent model the Assess intervention is not utilized, and a fifth A, Anticpatory Guidance, has been added. The adolescent 5 As should include:

1. establishing tobacco use and second-hand smoke exposure at nearly every visit;
2. establishing the tobacco use status of all patients and the use status of everyone in the home;
3. discussing the effects of smoking on the adolescent's systemic and oral health; and
4. assisting with tobacco avoidance by providing information that they can use that will help patients quit.[93]

Additionally, clinicians should provide self-help materials.

The modified "5 As" program can be used by the clinician to help the adolescent make a more effective quit attempt. Typically, it takes only 3 to 5 minutes to discuss tobacco with each patient. As clinicians develop their own style for talking to adolescents, they will feel more comfortable. It is important to recognize that stopping tobacco use is a process, and there are a number of stages of quitting—every adolescent that is counseled will not be able to quit immediately. Regardless of the individual stage of quitting, it is important to: (1) not give up; (2) be persistent; and (3) be supportive.

Pharmacotherapeutics for tobacco cessation

Pharmacotherapeutics have been shown to be effective in tobacco cessation efforts directed at cigarette smokers. Pharmacotherapy agents include: (1) bupropion SR (sustained release); (2) nicotine gum; (3) nicotine inhaler; (4) nicotine nasal spray; and (5) the nicotine patch. There is insufficient evidence to suggest that the use of tobacco dependence pharmacotherapies increases long-term abstinence rates among smokeless tobacco users. Specifically, studies conducted with nicotine gum and the nicotine patch have shown that these 2 medications have not increased abstinence rates in this population.[69]

When treating adolescents, clinicians may consider prescriptions for bupropion or nicotine replacement therapy (NRT) when there is evidence of nicotine dependence and a desire to quit tobacco use.[69] There have been limited pharmacological trials to evaluate the effectiveness of nicotine replacement therapy (nicotine patch, gum, lozenge, spray) and non-nicotine replacement therapy (bupropion) for treating tobacco dependence in teenagers.[69,94] In open-label trials of the nicotine patch and bupropion, results have shown low to moderate abstinence rates in adolescents.[95]

A recent study was conducted to determine the safety and efficacy of the nicotine patch and gum—coupled with counseling—in 13- to 17-year-old Baltimore adolescents. The study found major differences in smoking abstinence based on the intervention method utilized.[95] The results

showed a significant difference in the point prevalence abstinence of the group using nicotine patch and gum when compared with the placebo group. The nicotine patch was also significantly more effective than placebo in helping dependent adolescent smokers receiving behavioral therapy to quit smoking. Both the nicotine patch and gum were well tolerated by study participants.[95] The Food and Drug Administration (FDA) has not approved nicotine replacement therapy for use in an adolescent population. Nicotine replacement, however, is prescribed to help teens quit tobacco use. Adolescents with nicotine dependence can benefit from nicotine replacement therapy.

There are other recommendations made by the US Public Health Service for: (1) current tobacco users who are unwilling to quit; (2) are former users who have just quit tobacco; and (3) have relapsed. For those unwilling to quit, the 5 Rs are recommended: (1) relevance; (2) risks; (3) rewards; (4) roadblocks; and (5) repetition.[69] For former quitters, dentists should reinforce the patient's decision to quit and help the patient resolve problems arising from quitting. Relapse prevention is especially important and can be delivered during dental visits or over the phone.[69]

Conclusions

Substantial literature exists detailing adult tobacco cessation programs, including evidence-based recommendations. Examples include use of the "5 As" in an office-based intervention and the use of pharmacotherapeutic agents agents to increase quit rates and maintenance of abstinence. These recommendations require modification for the adolescent patient, as they may be earlier in the addiction process and less responsive to offers of assistance.

Additional research is needed to evaluate the clinician's role in tobacco cessation programs for adolescents. The dental clinician has the opportunity to intervene to prevent and treat tobacco use in the adolescent patient. It is important not to miss this opportunity. The consequences of tobacco addiction in adolescence are well established. Adolescents who use tobacco are likely to continue as adults, resulting in substantial oral and systemic effects that can lead to increased morbidity and mortality. The dental clinician can work to prevent tobacco use by adolescents by identifying parents and caregivers of their patients who use tobacco. Once they are identified, the clinician can provide advice to quit and assist with and arrange a quit attempt. It is also important for the dental clinician to urge parents to discourage tobacco use by any adolescent family members. When dealing with teenage patients, the clinician can play a role in preventing tobacco use onset by identifying those adolescent patients who are at risk of experimenting with tobacco. This can be accomplished by asking every adolescent about tobacco use and exposure at every office visit. Once identified as being at risk, the clinician can reinforce tobacco avoidance behaviors with the patient.

Acknowledgements

The authors would like to acknowledge Ms. Angela Ward and Ms. Sharifa Williams for their assistance with the compilation and editing of the manuscript.

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