The State of Office-Based Interventions for Youth Tobacco Use

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ABSTRACT. Tobacco use is a serious pediatric health issue as dependence begins during childhood or adolescence in the majority of tobacco users. Primary care settings provide tremendous opportunities for delivering tobacco treatment to young tobacco users. Although evidence-based practice guidelines for treating nicotine dependence in youths are not yet available, professional organizations and the current clinical practice guideline for adults provide recommendations based on expert opinion. This article reports on the current tobacco treatment practices of pediatric and family practice clinicians, discusses similarities and differences between adolescent and adult tobacco use, summarizes research efforts to date and current cutting-edge research that may ultimately help to inform and guide clinicians, and presents existing recommendations regarding treating tobacco use in youths. Finally, recommendations are made for the primary care clinician, professional organizations, and health care systems and policies. Pediatricians and other clinicians can and should play an important role in treating tobacco dependence in youths. PEDIATRICS 2003;111:e650–e660. URL: http://www.pediatrics.org/cgi/content/full/111/6/e650; tobacco, youth, treatment, primary care providers.

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ABBREVIATIONS. AAP, American Academy of Pediatrics; CCHR, Center for Child Health Research; PHS, Public Health Service.

Tobacco use is the leading preventable cause of illness and death in the United States. It is a serious pediatric health issue, as in the majority of cases dependence begins during childhood or adolescence, developing very quickly in some youths. The most powerful predictor of adult smoking is smoking during adolescence. Nearly 90% of adult smokers smoked their first cigarette and 71% were daily smokers before age 18; 60% started before age 14. Although recent data suggest that smoking among high school students may be leveling off or declining from a peak of 37% reported in 1997, 4800 adolescents experiment with cigarettes and 3000 become established smokers each day. The most recent National Youth Tobacco Survey found that 35% of high school students reported current use of tobacco, defined as use in the past 30 days, and 28% reported smoking cigarettes. In 2001, 19% of 12th-grade students reported daily smoking. Almost 75% of adolescent daily smokers who believe that they will not be smoking in 5 years find that they are unable to quit. The American Academy of Pediatrics (AAP) has issued a number of policy statements relevant to the problem of adolescent smoking and nicotine dependence in the past 5 years, attesting to the fact that pediatricians as a group are well positioned to take an active role in addressing this issue.

Although the most serious health outcomes associated with smoking typically emerge later in life, adolescent smokers show evidence of airway obstruction, slowed growth in lung function, and higher rates of cough and other respiratory symptoms, compared with nonsmokers. In addition, the earlier individuals begin to smoke, the higher their risk for cancer, heart disease, stroke, and chronic obstructive lung disease; nicotine addiction, and possibly their risk of developing anxiety disorders and depression. If current tobacco use patterns continue—an estimated 5 million youths between the ages of 0 and 17 years in 1995—then approximately 1 in 3 adolescent smokers will die of a smoking-related disease. Although cessation is less common among adolescents than adults, interest in quitting is strong: nearly three fourths of adolescent...
smokers have seriously thought about quitting, 64% report having made a quit attempt, and 40% of daily smokers report having tried to quit at least once and failed.6 Cessation and successful abstinence are more common in smokers who began smoking at or after 17 years of age.21 Among 17-year-old smokers, 40% report that they would be interested in cessation treatment.6

There is a national effort under way to prevent and treat tobacco dependence among adolescents. One of the Healthy People 2010 objectives is to decrease by half the rate of tobacco use among young people and to allow every young tobacco user access to effective cessation interventions by the year 2010.22 Meeting these ambitious goals requires interventions at the individual level; at the organizational level through health plans, schools and communities; and at the societal level to change norms and policies regarding youth tobacco use and access. This article focuses on ways to increase the availability and accessibility of effective tobacco treatment delivered within existing adolescent health services, an essential part of a comprehensive intervention strategy to prevent and treat tobacco dependence in adolescents.

Primary care settings provide key opportunities for delivering tobacco treatment, because pediatricians, family practitioners, and other clinicians are in a unique position to identify and intervene therapeutically with young tobacco users.23 Between 63% and 85% of adolescents are seen for preventive care visits each year.24–26 A recent study found that 63% of adolescents aged 14 to 17 were seen in primary care over the course of 1 year and 83% over 2 years.27 Among those with at least 1 visit, 60% had 2 or more visits during the year. Because of their authority, credibility, and long-term relationship with patients, clinicians are afforded many clinical opportunities and teachable moments to deliver smoking prevention messages and reinforce cessation interventions during routine care.7

There is strong evidence that brief counseling by physicians, dentists, and other health care providers increases smoking cessation rates in adult patients.28–39 Evidence-based clinical practice guidelines are available to clinicians and health care organizations on how to treat nicotine dependence among adults.39 In contrast, there is sparse evidence regarding the efficacy of brief clinician interventions in treating tobacco use in adolescence. At present, expert opinion rather than empirical data is used to guide clinical interventions for young smokers. Existing guidelines routinely recommend that clinicians deliver strong messages regarding abstaining from tobacco and cessation of use to children and adolescents;7,21,35,40–48

Despite consensus among experts regarding these recommendations, many pediatricians and family practitioners do not routinely assess and counsel youths about tobacco use.39–57 In January 2001, a group of experts in youth tobacco control met to establish the Tobacco Consortium of the American Academy of Pediatrics Center for Child Health Research (CCHR). The CCHR is a national research institute created by the AAP in September 1999. One of the CCHR’s primary activities is to bring together cross-disciplinary, topic-focused groups of experts to work on identifying and addressing unanswered questions of importance to children’s health. The goal of the CCHR Tobacco Consortium is to catalyze the translation of findings from tobacco prevention and cessation research into clinical practice to improve the health of children and adolescents. This article is the second in a series developed by the AAP-CCHR Tobacco Consortium to share what is currently known about tobacco use and treatment in children and youths, including current professional practice; similarities and differences between adult and adolescent tobacco use; research efforts to date; current clinical practice guidelines; and recommendations for clinicians, professional organizations, and health care systems and policies.

CURRENT PRACTICE

Recent state and national surveys of primary care clinicians’ practice behaviors and attitudes suggest that opportunities remain for clinicians to improve delivery of tobacco interventions for their adolescent patients.49–57 Surveys in both Massachusetts49 and New York50 found that a majority of pediatricians and family physicians report assessing smoking status in most or all of their patients, encouraging most or all not to start using tobacco, and providing advice to those who smoke to stop smoking. However, fewer report engaging in more detailed counseling with children and adolescents who smoke, such as helping patients to identify triggers to smoke, developing a quit plan, setting a quit date, or scheduling smoking-related follow-up visits. Pediatricians report a greater tendency to encourage children and adolescents not to start using tobacco than to intervene with those who already smoke.49 Reasons that pediatricians are more likely to address prevention than to intervene with current smokers include that 1) they perceive their role as one of prevention more than cessation, 2) they report greater self-efficacy or confidence in conducting preventive intervention and believe it to have greater effectiveness than cessation interventions, and 3) they perceive that other pediatricians in their community are committed more to prevention than to cessation interventions.

Dentists also have the opportunity to address youth tobacco use, particularly with regard to smokeless tobacco. Surveys in Texas58 and Connecticut59 indicate a similar pattern in dental practice. For example, in the Texas survey, one fourth of dentists did not consider smokeless tobacco counseling to be a high priority in practice, and one quarter of dentists did not feel adequately prepared to counsel smokeless tobacco users.58

The majority of these studies showed that clinicians report substantial rates of screening and lesser rates of counseling. However, clinicians tend to overestimate their screening and counseling practices, both for smoking and for other preventive services, in comparison with patient reports.59–64 For example, data for visits by adolescents (defined as ages 11–21) were analyzed from the 1991 National Ambulatory Medical Care Surveys in which office-based

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physicians recorded information about randomly selected patients after the patient visit. In 1991, whereas physicians reported screening 72% of their adolescent patients for tobacco use, they reported counseling about smoking at only 2% of all visits and at 17% of visits with adolescents who identified themselves as smokers. It is sobering to note that these findings did not change from 1991 through 1996. Primary care physicians were more likely than specialists to identify an adolescent’s smoking status and to counsel about smoking. It also was found that adolescents with conditions that could be complicated by smoking, such as asthma, acute upper and lower respiratory infections, and pregnancy, were more likely to be counseled than those with other conditions. This finding was not born out in a more recent study, which found that children at risk for diseases affected by tobacco use, such as asthma, were not more likely to have received counseling interventions. In contrast to physician report, in a national telephone survey of 7960 adolescents, only 25% reported that a health care provider had talked to them about cigarette smoking in the last year. Adolescent report of visits has been found to be more accurate than either physician report after a visit or chart review.

Reasons for the low rates of addressing tobacco in youths include a lack of clear clinical practice guidelines, lack of training, perception of poor effectiveness of interventions, perception of low self-efficacy in delivering effective intervention, and lack of reimbursement or other incentives for delivering treatment. Clearly, we need to enhance clinician involvement in treatment interventions directed at adolescent smokers. If health care provider delivery of counseling can be improved and extended with effective adjuncts, then the national implementation can have a significant effect on adolescent smokers. Assuming that there are 3,000,000 adolescent smokers and 50% have well visits each year, a modest 3% to 5% effectiveness rate would result in 45,000 to 75,000 new ex-smokers each year.

**SIMILARITIES AND DIFFERENCES BETWEEN ADOLESCENT AND ADULT TOBACCO USE**

How can tobacco treatments for youths be extrapolated from successful adult models? There are both similarities and differences in the smoking patterns and behaviors of adolescents and adults. Evidence suggests that the onset of symptoms of nicotine dependence is very rapid for some youths, and, just as for adults, low rates of annual spontaneous quitting are apparent. Both adolescents and adults continue to smoke for pharmacological effects of nicotine to modulate mood or to control weight. Withdrawal symptoms are comparable among adults and adolescents, and symptom intensity may interfere with readiness to quit among adolescents. Adolescents and adults also demonstrate similar smoking behavior in laboratory settings, even among nondependent youths. Both achieve comparable levels of cotinine, the metabolite of nicotine and a marker of consumption, and demonstrate similar cognitive decrements during acute abstinence. In addition, similarities between adolescents and adults in the progression of stages of change toward quitting have been described.

Significant differences between adolescent and adult smokers include developmental issues relating to smoking trajectory in adolescents. Youths typically are experimental, early regular, or daily smokers. In contrast, most adults are daily smokers and are addicted, with only a small but growing proportion of adult smokers (approximately 20%, ie, “chippers”) not fulfilling the criteria for dependence. These adult smokers may be consuming low levels of nicotine that offset becoming addicted or may have retained adolescent patterns of smoking (eg, intermittent social use). Youths also may be more affected than adults by social, peer, and image factors, which is suggested by the finding that youths tend to smoke the more advertised brands of cigarettes. With regard to treatment, youths may have had fewer quit attempts and may be less ready or less motivated to seek treatment than adults. Youths also may have fewer negative health, job, or social consequences of smoking that would motivate and reinforce quitting behavior. They may have fewer resources for quitting because of their stage of social development, a lack of data regarding what works best in helping youths stop tobacco use, and health care systems are not in place to provide cessation treatment. Young tobacco users who want to quit may have less control over their exposure to smoke and tobacco use within the home environment, including concurrent smoking by parents or siblings.

In addition, ethnographic work suggests that adolescents may view quitting differently from adults and think of quitting in terms of stopping temporarily for some reason (eg, sports season, family vacation) rather than quitting for good. The better we understand what adolescents perceive as useful in helping them to quit tobacco use, the better our chances of reaching them with messages and resources that they will actually use. Research in this area also is challenging given many barriers to conducting research with youths, such as difficulty recruiting adolescents, high attrition rates, and ethical constraints. Thus, despite similarities between adolescent and adult smokers (pharmacological dependence, withdrawal, desire for treatment, and readiness to quit), substantial differences challenge both adolescents who smoke and the providers who care for them, requiring that adaptations be made in the adult treatment model to address these unique challenges that adolescents face.

The adult tobacco treatment research does provide very clear direction regarding the need for and impact of establishing office systems to support the delivering of interventions by clinicians. Evidence clearly shows that the use of a screening system to identify tobacco use status increases the delivery of tobacco treatment to adults by clinicians, and the practice guideline strongly recommends that office practices establish systems to identify tobacco use and prompt clinicians to intervene. The establishment of an office system to screen for tobacco use among youths and prompt clinician delivery of to-
bacco treatment will be equally important in pediatric and family medicine practices to make the identification and treatment of tobacco use a routine and integral part of pediatric care.

**RESEARCH TO DATE**

In a comprehensive review of adolescent tobacco use cessation trials, which updated an earlier review by the same author, only 15 of the 66 trials reviewed were experimental (ie, used randomized assignment to maximize validity). The remainder were quasiexperimental (ie, a control group compared naturalistic cessation rates with intervention condition rates) or single-group designs (ie, no comparison or control group). In studies with control-group comparisons, mean quit rates at 3 or more months of follow-up were 7% in control groups and 12% in intervention conditions, with cessation interventions doubling quit rates on average. Class-room programs had the highest quit rates (17%), followed by computer-based expert system programs (13%) and school-based clinics (12%). The review found that a greater number of therapeutic sessions correlated with more powerful intervention effects, consistent with adult tobacco use cessation studies. Key factors that seem to enhance quitting included 1) facilitating access to treatment by adolescents; 2) structuring the context of the program to provide ongoing support of cessation efforts; 3) tailoring intervention to the development and lifestyle of adolescents; 4) enhancing intrinsic and extrinsic motivation to quit “now” versus “in the future,” including increasing adolescents’ awareness of the gradual changes that occur as a result of smoking (eg, increased stress, decreased mood) and quitting (eg, decreased stress, improved mood); 5) helping adolescents to overcome their ambivalence toward quitting; and 6) making the intervention as enjoyable as possible. In a recent meta-analysis of 66 adolescent tobacco use cessation trials, the best predictors of adolescents’ quitting without formal assistance were 1) living in a social milieu that has fewer smokers/more nonsmokers, 2) reporting less pharmacological or psychological dependence on smoking (ie, lower smoking levels and less experience with smoking), 3) intending not to smoke in the future, 4) holding antitobacco beliefs (eg, belief that society should place controls on smoking and perceiving smoking as a negative behavior), and 5) feeling relatively hopeful about life.

Few studies have evaluated the impact of brief interventions for adolescent smoking cessation delivered in health care settings. Given the significant increase in quit rates among adult smokers who receive brief provider-delivered office interventions, expert consensus panels have consistently recommended similar brief office interventions for adolescents. Studies to evaluate clinical interventions delivered within a health care setting have generally used either a single-group or an experimental design with random assignment. The majority involved the use of special cessation sessions and/or interventionists at the health care site, whereas few incorporated tobacco treatment into routine care delivered by the health care provider. For instance, 1 protocol invited adolescent smokers who were seen during in-home assessments or contacted by telephone to attend special tobacco treatment sessions at their health maintenance organization, which involved a 60-minute office visit with a nurse practitioner, a video followed by discussion with the nurse practitioner, a “quit kit,” entry into lottery if abstinent, and telephone follow-up calls for those interested in quitting. No difference was found in carbon monoxide-verified abstinence rates between intervention and control (n = 229) and control (n = 113) subjects at 1-year follow-up, and there was no relationship between the number of contacts with the interventionist and either quit rates or number of cigarettes smoked. Although treatment occurred within a health care setting, it was not linked with the adolescent’s primary care provider and was not delivered within the context of the adolescent’s usual contact with the health care system. In another study, adolescents were screened and smokers were identified at the time of their visit to the emergency department, outpatient clinic, or inpatient unit of a medical hospital clinic and randomly assigned to receive a motivational intervention or brief advice by experienced interventionists. Health care providers were not involved in delivering any component of the intervention. At the 3-month follow-up, biochemically validated quit rates were 20% in the motivational interviewing condition and 10% in the brief advice condition; however, this difference was not statistically significant as this was a preliminary study with a small sample size (n = 40).

The few studies that incorporated tobacco treatment intervention into routine primary health care showed mixed results. For instance, Glasgow et al randomly assigned 506 adolescent girls during Planned Parenthood visits for contraception to receive either simple advice to quit smoking from their health care provider or a brief motivational counseling intervention from clinic staff, a short videotape, and 1-3 follow-up support telephone calls. At the 6-month follow-up, 10% of the women who received the intervention and 6% of those who received advice to quit were abstinent, a nonsignificant difference. In a randomized trial of 518 adolescent male smokers (smokeless) tobacco users, the smokeless tobacco intervention was delivered by dentists and dental hygienists in the course of routine dental care and consisted of an oral examination with special attention given to where tobacco was used, a quit kit, advice to quit, video viewing, self-help manual, brief counseling by a dental hygienist, and follow-up telephone call and monthly mailings. The intervention produced significantly greater quit rates at 3- and 12-month follow-ups in intervention versus control subjects (32% vs 21% and 34% vs 25%, respectively). In a nonrandomized study conducted in Sweden, 101 adolescents who attended their regular dental examination were interviewed regarding their tobacco use. In the first year, only baseline data were collected. In years 2 and 3, all adolescents (tobacco users and nonusers) seen within the dental practice
were exposed to information regarding tobacco use in the waiting room (posters, brochures, and a video) followed by individualized information provided by the adolescent’s dentist, dental hygienist, or dental nurse during their routine check-up. Adolescents who were interested in quitting were referred to a cessation program. Significantly fewer adolescents reported daily tobacco use in year 3 of the study compared with year 2 (7.3% vs 11.5%).92 It is unclear to what extent the difference was related to preventing nonusers from starting versus helping users quit.

Interest in developing and evaluating tobacco cessation interventions for adolescents has increased dramatically in recent years, and a number of organizations are currently involved in conducting or funding research in this area.98 The National Institutes of Health currently funds studies to investigate innovative strategies in adolescent tobacco cessation. Of these studies, 10 are randomized, controlled trials in clinical settings investigating the efficacy of brief and intensive behavioral and pharmacological interventions for adolescent cessation (see Table 1). The results of these trials will help to shed light on the benefit of using the clinical setting and encounter as an opportunity to intervene with adolescents regarding tobacco dependence and will guide future research and clinical recommendations.

CURRENT CLINICAL PRACTICE GUIDELINE

The current Public Health Service (PHS) clinical practice guideline for adult smokers recommends office systems be established to screen for tobacco use and prompt clinician intervention and that clinicians engage in the 5 As intervention: 1) ask about tobacco use at every visit, 2) advise all tobacco users to stop, 2) assess their willingness to make a quit attempt, 4) assist the patient in quitting, and 5) arrange follow-up contact to support their efforts.35 The guideline concludes that brief physician advice to quit improves adult cessation rates, and the addition of brief counseling (<3 minutes) is even more effective. Both behavioral counseling and pharmacotherapy (nicotine replacement therapy—gum, patch, nasal spray, and inhaler—or the antidepressant bupropion SR) were found to be effective for adults. A combination of behavioral and drug therapy was found to produce the best results.99

No evidence-based guidelines are currently available to guide the delivery of brief tobacco cessation interventions to youths by clinicians during routine health care. Until sufficient evidence is gathered to develop youth-tailored guidelines, experts and professional organizations recommend adapting interventions found effective with adults to children and adolescents based on their developmental needs.35,89 The PHS guideline, which is endorsed by the AAP, takes this approach and provides consensus recommendations for practitioners who work with youths: 1) screen pediatric and adolescent patients for tobacco use and provide a strong message regarding the importance of abstaining from tobacco use; 2) consider the use of counseling and behavioral interventions shown to be effective with adults and adolescents who are interested in quitting, modifying the content of these interventions to be developmentally appropriate to adolescents; and 3) consider prescribing bupropion SR or nicotine replacement therapy for adolescents who have both symptoms of nicotine dependence and a desire to quit35 (see Fig 1).

With regard to modifying the intervention recommended by the PHS guideline to be developmentally appropriate to adolescents, there are currently scarce data from which to draw a “typology” of the adolescent smoker and how one might best adapt this model. As such, a case-by-case adaptation is warranted. One might emphasize factors such as the image associated with smoking as well as environmental pressures that apply toward both smoking and nonsmoking, such as the role of peer groups and the impact of family and adult figures and social and community norms. In addition, given that tobacco use is often associated with other health risk behaviors and comorbidities (see Fig 1), identifying and treating tobacco use in adolescents provides an opportunity to address these other risk behaviors as well and to tailor further the intervention to the adolescent. With regard to the measurement of nicotine dependence, it should be noted that dependence and addiction measures that often are used as eligibility criteria for clinical trials and indications for pharmacotherapy are not well defined for youths. In addition, interethnic qualitative differences found among youths may reflect metabolic variations demonstrated in adult smokers.100 Research tools exist for measuring dependence, for example, the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition101 and the Fagerström Questionnaires (eg, Fagerstrom Tolerance Questionnaires, Fagerstrom Test for Nicotine Dependence),102 but their use with adolescents or for determining appropriate clinical interventions is still experimental.103,104 As indications for pharmacotherapy, evidence from clinical practice suggests any of the following: 1) the presence of withdrawal symptoms, 2) smoking >10 cigarettes per day, and 3) smoking within the first hour of waking.

In addition to the recommendations for intervention proposed by the PHS guideline and endorsed by the AAP above, clinicians who work with adolescents who smoke might encounter challenges that include the use of alcohol or other drugs, irregular attendance at treatment sessions, lesser control over home and social environment, and inadequate treatment compliance. Genuine demonstration of interest and caring as well as positive reinforcement for the adolescents’ efforts by the clinician and staff are ways to support adolescents further in overcoming some of these difficulties. For instance, tangential issues brought up by adolescents that do not seem to be directly related to smoking cessation topics (eg, breaking up with a boy/girlfriend, family and school issues) can be viewed as indirectly relevant to a adolescent’s smoking behavior and incorporated into treatment. Actively listening to these concerns may prove useful both to address barriers to cessation and to enhance therapeutic rapport.

Before the most recent clinical practice guideline and AAP’s endorsement, numerous professional or-
Some studies did not have inclusion criteria related to level of tobacco use and/or addiction level. A decade earlier, the AAP and the National Cancer Institute developed recommendations for health professionals to prevent their child and adolescent smokers from becoming regular smokers and adults who use tobacco products. 23,40–48

<table>
<thead>
<tr>
<th>Intervention (Institution; Principal Investigator)</th>
<th>Comparison Group(s)</th>
<th>Study Participants*</th>
<th>Primary Endpoints</th>
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<tr>
<td>Brief intervention by primary care provider plus on-site peer counseling tailored to stage of acquisition and readiness to change (University of Massachusetts Medical School; L. Pfert)</td>
<td>Usual care</td>
<td>Youths aged 13–17 y presenting to pediatric office for well and acute care visits; both smokers and nonsmokers eligible for study; no inclusion criteria for level of smoking or addiction</td>
<td>30-d abstinence prevalence at 6 and 12 mo; no biochemical verification (bogus pipeline used)</td>
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<tr>
<td>In-home, internet-based interactive program (Mayo Clinic, Minnesota; C. Patten)</td>
<td>AMA brief office intervention for 4 wk</td>
<td>Youths aged 11–18 y recruited from the community; ≥10 CPD over past 30 days; cigarettes the primary form of tobacco use over past 30 days</td>
<td>30-d abstinence prevalence at 6 and 12 mo follow-up; biochemical confirmation with exhaled CO</td>
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<tr>
<td>Brief intervention by primary care provider plus self-help adjuncts: sequential mailings, quit line, and web site with interactive chats (University of Rochester; D. Ossip-Klein)</td>
<td>Usual care</td>
<td>Youths aged 14–18 y presenting to pediatric and family practice office for well visit; had smoked at least 1 cigarette in the past 30 days; no inclusion criteria for level of addiction</td>
<td>30-d abstinence prevalence at 3 and 12 mo, no biochemical confirmation on entire sample (may verify subsample)</td>
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<tr>
<td>Brief advice by health care provider plus expert system interactive computer program and brief motivational interview by health educator (Kaiser Permanente; J. Hollis)</td>
<td>Diet attention control</td>
<td>Youths aged 14–17 y presenting to pediatric office for well and acute care visits within an HMO; both smokers and nonsmokers eligible for study; no inclusion criteria for level of smoking or addiction</td>
<td>30-d abstinence prevalence 2 y after study entry; no biochemical confirmation</td>
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<td>Nicotine patch and gum (double-blind, double-dummy) for smoking cessation plus cognitive behavioral therapy group counseling sessions conducted in a teen tobacco specialty clinic (NIDA Intramural Research; E. Moolchan)</td>
<td>Placebo patch, placebo gum</td>
<td>Youths aged 13–17 y recruited from the community; ≥10 CPD; FTND score &gt; 5</td>
<td>Smoking cessation/reduction at 3 and 6 mo; biochemical confirmation with exhaled CO salivary thiocyanate</td>
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<tr>
<td>Brief, individual motivational interview / treatment by trained treatment providers, plus booster session by phone 1 wk later (Brown University; P. Monti)</td>
<td>Brief advice to quit smoking</td>
<td>Youths aged 12–18 y presenting to emergency room, adolescent clinic, physician’s office and recruited from area high schools and community at large; reported smoking at least weekly to be eligible</td>
<td>30-d smoking prevalence and 7-d point prevalence at 1, 3, and 6 mo; biochemical confirmation with exhaled CO and salivary cotinine</td>
</tr>
<tr>
<td>Tailored motivational intervention, relapse prevention and mood management training, telephone counseling, and nicotine patch for youths with nicotine dependence, with behavioral treatment delivered by clinical psychologists (Brown University; R. Brown)</td>
<td>Brief advice and self-help materials plus nicotine patch for youths with nicotine dependence</td>
<td>Youths aged 13–17 y admitted to hospital with comorbid psychopathology; smoked ≥1 cigarette per wk for past 4 wk</td>
<td>7-d point prevalence abstinence at 1 year; biochemical confirmation with exhaled CO and salivary cotinine</td>
</tr>
<tr>
<td>Motivational interview by dental hygienists plus follow-up calls, self-help materials, nicotine replacement if necessary, enlist parental support with adolescent permission (University of Minnesota; H. Lando)</td>
<td>Usual care</td>
<td>Youths aged 14–17 y presenting for scheduled dental appointment</td>
<td>30-d smoking prevalence at 3 and 12 mo; no biochemical confirmation</td>
</tr>
<tr>
<td>Bupropion 150 mg/d or 300 mg/d plus brief counseling by research clinic nurse or health educator (University of Arizona; M. Muramoto)</td>
<td>Placebo plus brief counseling</td>
<td>Multicultural youths aged 14–17 y recruited from community and alternative schools</td>
<td>Continuous abstinence and 7-d point prevalence abstinence at end of treatment (6 wk after quit) and at 6 mo; biochemical confirmation with exhaled CO and urinary cotinine</td>
</tr>
<tr>
<td>Bupropion 300 mg/d with AMA brief office intervention and parental support provided by a research counselor (Mayo Clinic, Minnesota; R. Hurt)</td>
<td>Placebo with minimal intervention (written self-help materials)</td>
<td>Youths aged 13–18 y recruited from the community; smoking at least 10 CPD; no minimum FTND score</td>
<td>7-d point prevalence smoking abstinence at end of treatment (12 wk) and 1 y; biochemical confirmation with exhaled CO</td>
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AMA, indicates American Medical Association; CPD, cigarettes per day; FTND, Fagerström Test of Nicotine Dependence; CO, carbon monoxide

* Some studies did not have inclusion criteria related to level of tobacco use and/or addiction level.
patients from smoking. The American Medical Association also developed recommendations that address tobacco use in their Guidelines for Adolescent Preventive Services, stating that 1) parents or other adult caregivers should receive health guidance at least once during their child’s early, middle, and late adolescence regarding multiple topics, including monitoring their adolescent’s social and recreational activities for the use of tobacco; 2) all adolescents should receive health guidance annually to promote the avoidance of tobacco; and 3) all adolescents should be asked annually about their use of tobacco, and, in those who report tobacco use, clinicians should conduct an additional assessment of pattern of use and assist the adolescent in developing a cessation plan. The American Academy of Family Physicians guidelines include the assessment and documentation of smoking and tobacco use as a routine part of the medical history and the provision of primary prevention or cessation counseling to both adolescents and parents.

Despite the obvious clinical and public health im-

Fig 1. Tobacco use assessment and treatment for adolescents: the 5 As.
clinicians may feel overwhelmed in dealing with complex social behaviors such as tobacco use during brief clinical encounters. They may screen and identify tobacco users but then be hesitant about how to proceed with successful behavior-change counseling. A comprehensive office system to address adolescent tobacco use may be most appropriate. For instance, an intake nurse might screen for tobacco use; the physician can provide advice; and if the adolescent is interested in quitting, then a nurse can deliver assistance and arrange for follow-up. The office can link the adolescent who is interested in quitting to tobacco treatment programs offered in the community or to quit lines or web sites tailored for adolescents. Having multiple clinicians and clinician types intervenes has been found to increase cessation rates in adults.35 Also helpful is for the pediatric clinician to consider his or her brief interventions within the primary care setting as 1 of several ways to address tobacco in youths and that he or she is not alone in this effort. The effectiveness of such interventions is most likely increased by the delivery of health-related messages offered in other settings, with the primary care clinician’s intervention complementing messages and programs offered in schools, through the media, via quit lines, and through other venues.108,109 Brief office-based intervention provides the opportunity to identify tobacco use and reinforce with the adolescent that this is a health concern worth addressing. Most adolescents who smoke or use tobacco want to quit. Office-based interventions are an opportunity for these adolescents to begin working toward the goal of cessation.

**RECOMMENDATIONS**

Although evidence is being gathered to develop clinical practice guidelines for the treatment of tobacco dependence in youths, tobacco treatment currently recommended by experts and professional organizations needs to be made available to youths through the health care system. Coordinated efforts are needed at several levels of the health care system to maximize the likelihood that cessation interventions will be routinely delivered to youths. Important points of intervention include the clinician (eg, best practices for clinicians, clinician training, tools), organizational systems (eg, health care system changes, office systems), and policy (eg, reimbursement, incentives, performance measures). A number of actions taken by the clinicians and their practices, professional organizations, and the health care system and policy makers will facilitate this goal of integrating tobacco treatment intervention into routine practice.

**Individual Clinicians and Their Practices**

Primary care clinicians are encouraged to develop office systems to integrate tobacco use screening and time-efficient cessation interventions into routine practice. This would include ensuring that all adolescents are screened for tobacco use and, if using, offering both brief advice and assistance and linkage to cessation resources available both within the health care settings and in the community, such as quit lines, web sites, and tobacco treatment programs. This should involve clear delineation of staff responsible for screening tobacco use, prompting physician or other clinician intervention, referring adolescents to additional resources for cessation, and establishing a follow-up system that will track each adolescent’s progress while providing the clinician with feedback to move the adolescent through the quitting process.

Primary care clinicians are encouraged to integrate their efforts into the social and environmental influences that are part of the adolescent milieu. Brief office-based interventions cannot be expected to carry the burden of tobacco treatment alone. Interventions that are delivered in the office are most effective when delivered in an environment that discourages tobacco use (eg, counter-advertising, restrictions on environmental tobacco smoke exposure and access to minors, price increases). As such, in addition to identifying tobacco use and moving adolescents through the cessation process, pediatricians and other clinicians can serve as community leaders and tobacco control advocates to champion social and environmental changes that support nonuse and cessation among youths.

**Professional Organizations**

Professional organizations are encouraged to increase awareness among their members about youth tobacco use and currently recommended strategies for addressing tobacco use. Relevant professional organizations might include Continuing Medical Education programming at state and national conferences to provide skill-building opportunities for clinicians who wish to learn strategies for treating youths for tobacco use. Professional organizations can encourage and reinforce instruction in tobacco treatment interventions for young smokers within physician training programs.

**Health Care Systems and Policies**

Managed care organizations are encouraged to provide coverage for tobacco-dependence medications and programs for youths, as many now do for adults.44,110 To support this effort, the Centers for Disease Control and Prevention should conduct surveillance on the prevalence of adolescent tobacco treatment programs, coverage, and office systems within managed care organizations and health plans. This effort would provide comparative feedback to states and health plans and would encourage implementation of these systems and treatment.

Health care industry decision makers are encouraged to implement policies that support the delivery of intervention for tobacco dependence in youths at the health care system level. Screening for tobacco use among youths and the delivery of advice and assistance to quit could be included in the managed care plan performance measures of the National Committee on Quality Assurance, such as the Health Plan Employer Data and Information Set report card.

Tobacco dependence develops during childhood and adolescence. The natural contact that adoles-
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