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## Chapter 4

# Approaches Directed to the Individual

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## Chapter 4

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### INTRODUCTION

The goal of any smoking control strategy is to influence individuals to choose nonsmoking status. Early efforts attempted to promote changes within the individual that would allow people to alter their behavior regardless of the social and environmental influences promoting smoking. More recently, public health professionals have recognized the need to change the smoking environment to provide persistent messages to quit and to encourage those who have quit not to relapse. Regardless of the smoking control strategy adopted, however, change must begin with the individual's choices. As a result, a major effort of any comprehensive smoking control strategy should be focused directly on the individual.

Three major approaches to the individual can be identified: (1) The first consists of public information campaigns that inform the smoker of the disease risks associated with smoking and continually present this information as a motivation for smoking cessation. (2) The second is the delivery of school-based health education curricula designed to prevent initiation of tobacco use by adolescents. (3) The third is the development of programs and clinics that smokers can use individually or in groups to improve the likelihood of long-term success with cessation attempts. Each of these approaches has important effects on the social environment and contributes synergistically to other components of a comprehensive smoking control effort; however, their major focus is on the individual.

### PUBLIC INFORMATION CAMPAIGNS

The changing role of the media in portraying cigarettes reflects the evolution of mass communication. The severe deleterious impact of smoking on health makes cigarette advertising a special concern. The past and present influence of tobacco companies, expressed through billions of advertising dollars, has both promoted tobacco use and effectively censored information on the adverse health consequences of tobacco use in most print media (Wallack, 1989; Warner, 1981 and 1985). This section reviews the historical role of the mass media and describes how cigarettes have been portrayed to the public by both protobacco and antitobacco groups. Modern antismoking media campaigns also are analyzed and discussed.

Hand-rolled, paper-wrapped cigarettes were first heavily marketed at the beginning of the 20th century, partly in response to public health campaigns against chewing tobacco. Such campaigns alleged that the practice of spitting tobacco

juice and wads onto streets and into cuspidors was a major contributor to the spread of tuberculosis and other communicable diseases. During this time, a new strain of tobacco that was much milder than cigar tobacco appeared on the market. For economic reasons and to expand their markets, the tobacco companies promoted a new milder cigarette as an alternative to chewing tobacco and as a product that offered a lower dose of nicotine. The development of cigarette rolling machines made the mass production of cigarettes more efficient and the products more available (Consumers Union, 1972).

Anticigarette campaigns were sponsored by educators, reformers, business leaders, and respected public figures in reaction to the marketing of the new milder, paper-wrapped cigarettes. In particular, the campaigns were designed to prevent smoking by women and children (Diehl, 1969; Troyer and Markle, 1983).

Although some groups opposed smoking for health reasons, others attacked smoking as a moral issue. They claimed that cigarette smoking affected the brain and therefore contributed to degeneracy. Ultimately, the campaigns resulted in legislation that prohibited or limited cigarette smoking in most states by the early 1920's. The impact of the laws on behavior was negligible, however. By 1927, the few states that still had smoking prohibition laws simply restricted sales to minors.

### **Early Presentation Of Smoking's Hazards**

Medical evidence that linked the increasing number of lung cancer deaths to smoking began to emerge in the United States in the late 1930's. Several researchers investigated the relationship between the tobacco industry's expenditures on mass media and the media's coverage of the risks of smoking. Even though the evidence linking smoking to lung cancer was newsworthy and was presented at press conferences, most newspapers and magazines censored the information, possibly because they feared the loss of advertising revenue (Bagdikian, 1983; Cirino, 1972; Consumers Union, 1972). Two major New York daily newspapers that carried limited information about the evidence restricted their stories to a few paragraphs placed inconspicuously in the middle or back of the paper (Bagdikian, 1983).

The revenue provided by tobacco advertisers has continued to suppress the presentation of the strong empirical relationship between smoking and health problems (Warner, 1985). Cirino (1972) reported that, from 1938 to 1955, only limited coverage was given to scientific evidence of the suspected link between smoking and lung cancer. At that time, the tobacco industry was a leading advertiser in newspapers and magazines in the United States. The tobacco companies

**Counter-  
advertising  
In the 1960's**

routinely screened magazines and newspapers prior to publication to find articles dealing with the relationship between smoking and health, and they withheld advertising from issues that contained information on the negative health effects of smoking (Warner, 1985).

The publication of the Surgeon General's Report in 1964 was accompanied by substantial media exposure. The impact of the mass media coverage was a 15 to 20 percent fall in cigarette sales across the United States within a few weeks of the report's release (Consumers Union, 1972); however, that impact was short-lived.

Cigarette consumption returned almost to pre-1964 levels within 1 year after the release of the Surgeon General's Report. Public health agencies launched several television-based anti-smoking campaigns between 1964 and 1970. The Consumers Union (1972) reported that mass media campaigns launched subsequent to the 1964 Surgeon General's Report had the following objectives: (1) to increase awareness of the negative health effects of smoking, (2) to promote abstinence among teenagers, and (3) to motivate current smokers to quit.

Several conclusions have been drawn from reviews of the early mass media campaigns against cigarettes and the influence of cigarette advertising (Consumers Union, 1972; Flay, 1987; Warner, 1981). The consensus was that mass media campaigns enhanced awareness of the detrimental effects of smoking on health. Such campaigns were found to motivate nonsmokers to abstain from smoking, at least temporarily. However, the antismoking educational campaigns seemed to have little sustained effect on changing the behavior of habitual smokers. Cigarette advertising was suggested to have a substantial influence on a young person's decision to start smoking.

**Persuasion  
Approaches of  
The 1970's and  
1980's**

Cigarette advertising associates smoking with enjoyment of life. Specifically, the advertising connects smoking with popular music, enhanced sexuality, popularity, and general happiness—overall, a very appealing message to adolescents. Furthermore, low-tar, low-nicotine cigarettes have been promoted by tobacco companies as less harmful alternatives to brands that have higher tar and nicotine concentrations. These advertising campaigns were found to be effective in motivating individuals who are concerned about their health to switch brands rather than to quit smoking. Almost 15 to 20 years later, the earlier conclusions presented by the Consumers Union have been replicated by additional research on the mass media, the tobacco industry, and advertising (Flay, 1987; Wallack, 1989; Warner, 1985; Warner et al., 1986).

To counter the financially and politically powerful tobacco industry, professionals in public health, communications, and education and political lobbying groups have conducted numerous mass media campaigns and interventions during the past 30 years. More sophisticated appeals, designed to promote abstinence or facilitate cessation, evolved from initial educational campaigns of the late 1960's and early 1970's. However, cigarette advertising and promotion expenditures also increased, from approximately \$491 million in 1975 to more than \$3 billion in 1988 in the United States (Centers for Disease Control, 1990).

The results of the U.S. public health campaigns conducted from 1967 to 1970 suggested sustained counteradvertising did affect the smoking-related beliefs and behaviors of many cigarette smokers (Warner, 1981). The results also suggested a dose-response relationship: As counteradvertising was increased and maintained, smoking prevalence decreased (Flay, 1987).

Flay (1987) reviewed 40 mass media programs and campaigns conducted in the past 30 years, evaluating their relative effectiveness in changing smoking prevalence rates and in sustaining quit rates. Comparing the programs and campaigns, however, was problematic. Most evaluations utilized posttest-only or single-group designs without randomization, and quasi-experimental designs made it difficult to attribute changes in smoking status to the program or campaign. However, several criteria were noted to maximize the effects of media campaigns against cigarettes (Flay, 1987), including the presentation of several different messages over a short time, widespread dissemination of information among the target audience, frequent airing of the messages, and long-term implementation of the advertising campaign.

Flay concluded that viewing a cessation program message on television was as effective for viewers as the American Lung Association self-help manuals were for requestors. The television programs, in combination with the manuals, were found to be more effective than the American Lung Association manuals alone. Moreover, the media viewing plus social support condition was found to be the most effective mass media condition in that study.

Using their integration of prevailing theory, Flay and Burton (1988) proposed the following six necessary and interrelated conditions for an effective campaign: (1) The campaign should include high-quality messages, information sources, and media channels. (2) The message must be disseminated to the target audience and presented frequently, with some variety, over a long duration and at optimal viewing times.

(3) The campaign must retain the audience's attention by ensuring the quality of the message, providing appropriate and supportive media channels, and ensuring that the message corresponds to audience characteristics. (4) Interpersonal communication among members of the target audience should be encouraged. Groups with opposing viewpoints should be encouraged to exchange dialogue that might influence social norms. (5) The campaign should facilitate changes in individuals in the target audience. For example, dialogue between smokers and nonsmokers could enhance smokers' awareness of their behavior's undesirable effects on others. (6) The campaign should influence social norms against smoking. Social norms might also be influenced by dialogue between legislators and their constituents; voter support of an increase in the excise tax on cigarettes might be one example.

A strategy often neglected in mass media campaigns has been to provide smokers with the requisite skills to quit smoking and to provide nonsmokers with the skills needed to remain abstinent (McAlister et al., 1989). Campaigns that have attempted to address these issues have done so primarily through applications of Bandura's social learning theory (i.e., the concepts of modeling, self-efficacy, and social support; Bandura, 1977). Television has been a popular medium for demonstration programs in which celebrities or trained individuals serving as role models provide specific instructions and demonstrate skills that the audience is encouraged to emulate (Flay, 1987; McAlister et al., 1989).

Three examples of such demonstration programs were discussed by McAlister and associates (1989). Each demonstration was a large-scale project, one of which was implemented on a national level throughout Finland. The remaining programs were community programs—one in the county of North Karelia, Finland, and the other in Houston, Texas. The results of the Finnish national program were reported in detail by Puska and colleagues (1979). In brief, the national project was a television-based program that featured a role model who was trained to facilitate successful coping strategies and who then guided a group of smokers through the stages of smoking cessation. The authors reported that, of the 30,000 to 40,000 smokers who participated in the televised series, approximately 10,000 former smokers credited the first year of their nonsmoking status to the program.

The community projects carried the mass media approach to smoking cessation a step further. In North Karelia, a comprehensive program for cardiovascular risk reduction included a smoking cessation component. In addition to a televised cessation series, the program included recruitment and training of 805 volunteers to provide social reinforcement to individuals

trying to quit smoking. The volunteers were also given self-help manuals to distribute to those individuals, and they reported success in helping approximately 500 smokers to quit (McAlister et al., 1989).

The Houston project ran concurrently with the American Cancer Society's Great American Smokeout. The media outlets used included the most widely viewed television station in Houston and one of the two city newspapers. Trained role models, who volunteered to attempt to quit smoking, were presented in specific programs, news announcements, and public service announcements. The role models were videotaped not only during group counseling sessions but also as they went about their daily activities. As part of the project's comprehensive approach, newspaper announcements featured motivational statements and specific instructions for cessation, and printed materials were distributed by local pharmacies and grocery stores (McAlister et al., 1989). Brief training and printed materials were also provided to community public schools and large businesses. The results indicated that 20,000 to 40,000 individuals quit smoking as a result of this campaign.

## **EVOLUTION OF SCHOOL-BASED INTERVENTIONS**

There have been a number of excellent reviews of school-based programs to prevent smoking published in the last dozen years (Bell and Battjes, 1985; Best et al., 1988; Botvin, 1986; Cleary et al., 1988; Flay, 1985; Flay et al., 1983; Glynn and Haenlein, 1988; Glynn et al., 1983; Goodstadt, 1978; Leventhal and Cleary, 1980; Schaps et al., 1981; Snow et al., 1985; Sussman, 1989; Thompson, 1978; Tobler, 1986; US DHEW, 1979; US DHHS, 1989). These reviews provide careful methodological critiques of published studies that must precede any attempt to draw general conclusions from such varied and extensive literature. Although they differ in their enthusiasm for the interventions tested to date, the reviewers agree that the so-called traditional approaches to smoking prevention are largely ineffective and that approaches based on the social-psychological models are at least modestly effective across a variety of settings, times, and populations.

The interventions reviewed here are presented in historical sequence and grouped by common concepts, and their similarities and differences are noted. Several of the intervention methods discussed here are now under study in projects too recent to have been included in previous reviews or to have published results.

### **Traditional Approaches** Information Model

The information model presumes that teaching adolescents that smoking is harmful will modify their attitudes and beliefs, which in turn will alter their smoking behavior. Information programs use various methods, including films, lectures, discussions, posters, pamphlets, newspaper articles, and

guest speakers, to provide factual information on what tobacco products consist of, how they are used, and what effect they have on health, especially long-term health outcomes (Goodstadt, 1978; Schaps et al., 1981; Thompson, 1978; US DHEW, 1979).

Although there is substantial evidence linking beliefs and attitudes with behavior (Fishbein, 1967; Fishbein and Ajzen, 1975; Hovland et al., 1953; McGuire, 1964 and 1969), the information model presumes that knowledge is the major determinant of behavior and thereby ignores the many complex social and personal factors that play an important role in the development of smoking among adolescents. The two major reviews of the smoking prevention literature based on the information model concluded that it was largely ineffective (Goodstadt, 1978; Thompson, 1978). In spite of these findings, the information model continues to predominate in school-based programs for smoking prevention outside the research milieu (Murray et al., 1988).

#### Affective Model

The affective model assumes that tobacco use is influenced largely by attitudes. Programs based on the affective model attempt to enhance self-esteem and self-image, to teach stress management and stress reduction, to clarify the student's values and show that tobacco use is inconsistent with those values, to improve decisionmaking, and to encourage greater achievement through goal-setting. Such programs often do not include specific information about tobacco or drug use (Durell and Bukoski, 1984; Goodstadt, 1978). The affective model evolved as educators and researchers recognized that the information model was inadequate and that youth who became involved with smoking or drugs often had a negative self-image, were poor achievers, had trouble making healthy decisions, and were under multiple stressors from their social environments.

Although attitude change can be an important component of behavior change, there is substantial evidence that the individual must also possess the skills to carry out the desired behaviors and believe that he or she can successfully execute those behaviors and that the behaviors will have the desired effect (Bandura, 1977; Maiman and Becker, 1974). There is little evidence that programs based only on the affective model have any beneficial effect on behavior with respect to tobacco or drug use (Hansen et al., 1988; Schaps et al., 1981; Tobler, 1986).

#### **Development and Application of Psychosocial Approaches**

Three major social-psychological approaches have evolved as alternatives to the traditional approaches described above. These psychosocial models are the social influences model, the cognitive behavioral model, and the life skills model.

The *social influences model* recognizes smoking in adolescence as primarily a social behavior. This model includes the following four components: (1) information on the negative social effects and short-term physiological consequences of tobacco use; (2) information on the social influences that encourage smoking among adolescents, particularly peer, parent, and mass media influences; (3) correction of inflated normative expectations of the prevalence of adolescent smoking; and (4) training, modeling, rehearsing, and reinforcing of methods to resist those influences and to communicate that resistance to others, particularly peers (Evans, 1976, 1983, and 1984; Evans et al., 1978, 1981, and 1984; Evans and Raines, 1982).

The initial effort also employed older peer leaders as facilitators and included a public commitment by the adolescent to not become a regular smoker (McAlister et al., 1979 and 1980; Perry et al., 1980a; Telch et al., 1982) or employed same-age peer leaders to increase the utility and visibility of leaders outside the formal classroom sessions (Hurd et al., 1980; Luepker et al., 1983). Jason (1979) experimented with modeling and rehearsing of pressure resistance skills but did not include the other elements of the social influences model and involved a single focus group of ninth graders. Evans (1976, 1982, 1984, and 1990) describes the social influences model as *social inoculation*. This model involves increasing children and adolescents' resistance to social influences that promote smoking by "inoculating" youth with knowledge and social skills for resisting such pressures. Furthermore, social inoculation includes training to understand and cope with not only *overt* social influences to smoke but also more subtle influences, such as smoking models in cigarette advertisements or individual perceptions of peer group smoking norms.

The *cognitive behavioral model* assumes that smoking is the result of both social and psychological factors, and therefore tobacco use is learned as an approach to meeting social needs (e.g., stress reduction, conversation supplement, transition marking). The cognitive behavioral model differs from the social influences model by including several intervention components that address belief-attitude-behavior structures that may increase adolescents' risk for tobacco use, and by using other than tobacco-related examples and settings as part of its generic social skills training. The earliest examples drew heavily on problem behavior theory (Jessor and Jessor, 1977) and cognitive behavior therapy (Kendall and Hollon, 1979).

The cognitive behavioral approach adopts the basic social influences model and adds role-playing, rehearsal, and reinforcement of pressure resistance skills. It includes problem-solving, decision-making, and self-control methods (Kendall

and Hollon, 1979) to teach adolescents how to recognize risks and manage initial impulses until they are able to evaluate options and select appropriate responses. It also includes self-reward methods (Bandura, 1977) to improve self-efficacy and to teach students to reward themselves for correct decisions. Early studies, like those based on the social influences model, showed positive results (Gilchrist et al., 1979; Schinke and Blythe, 1981; Schinke and Gilchrist, 1983) but were subject to a number of methodological limitations (for a discussion, see Flay, 1985).

The *life skills model* incorporates the four elements of the social influences model; the decision-making, problem-solving, self-control, and self-reward strategies from the cognitive behavioral model; and methods to develop greater autonomy, self-esteem, and self-confidence from the affective model. Even more than the cognitive behavioral model, the life skills model provides training to help adolescents cope with social challenges, including those that involve tobacco.

The life skills training program used a social-psychological approach and had promising results. A 10-session life skills training program reduced the incidence of new smoking by 75 percent in one study involving 8th, 9th, and 10th graders (Botvin et al., 1980). Botvin and Eng (1982), in a 12-session life skills training program involving only seventh graders, showed students smoking less at 1-year followup, reducing new smoking by a significant 58 percent. The 12-session life skills training program is described in Table 1.

Table 2 presents a comparison of some psychosocial school-based interventions. Included are the intervention grades, frequency and number of sessions, the intervention administrator, and size of the study population.

The following sections summarize subsequent work on the three psychosocial models, especially refinements and applications along the following four dimensions: (1) program variations, involving the type of instructor, the timing and spacing of the sessions, the targeted age group, and use of media supplements; (2) the addition of complementary delivery channels such as mass media, community organizations, and parent involvement; (3) the addition of complementary target outcomes such as substance use, nutrition, physical activity, and other health behaviors; and (4) long-term followup studies. For each model, the concluding paragraphs describe current and planned activities. It is notable that, in the course of continued development, there has been a gradual merging of the components of three psychosocial models.

Table 1  
A 12-session life skills training program

Session	Topics
Orientation	General introduction, saliva collection, pretest questionnaires
Smoking: myths and realities	Common attitudes and beliefs about smoking, prevalence of smoking, reasons for and against smoking, process of becoming addicted, decreasing social acceptance of smoking
Smoking and biofeedback	Effects of smoking on carbon monoxide levels and heart rate
Self-image and self-improvement	Self-image and how it is formed, self-image and behavior, importance of positive self-image, improving self-image
Decision-making and independent thinking	General decision-making strategies, sources of influence affecting decisions, resisting persuasive tactics, importance of independent thinking
Advertising techniques	Use and function of advertising, ad techniques, identifying ad techniques in cigarette ads and how they affect consumers' behavior, alternate ways to respond to these ads
Coping with anxiety	Situations causing anxiety, demonstration and practice of techniques for coping with anxiety
Communications skills	Verbal and nonverbal communication, learning to communicate effectively, techniques for avoiding misunderstanding
Social skills A	Overcoming shyness, initiating social contacts, giving and receiving compliments, basic conversational skills
Social skills B	Boy-girl relationships, nature of attraction, conversing with the opposite sex, asking someone for a date
Assertiveness	Situations calling for assertiveness, reasons for not being assertive, verbal and nonverbal assertive skills, resisting peer pressure to smoke
Conclusion	Review, conclusions, saliva collection, posttest questionnaires

*Adapted from Botvin and Eng (1982). Sessions were 1 hour in length, and there was one session per week for 12 weeks.*

**Social Influences Model**      *Program variations.* Variations in the programs consist of changes in delivery of the instructional material, age of the students, use of media supplements, involvement of parents, and rewards for low smoking rates. Positive effects have been reported when the social influences model was delivered by project staff (rather than classroom teachers) (Coe et al., 1982; Dielman et al., 1985; Jason et al., 1982; Shaffer et al., 1983; Spitzzeri and Jason, 1979). Coe and colleagues (1982) used freshman medical students, who learned the intervention

Table 2  
A comparison of some psychosocial school-based interventions

	Intervention Grades	Number of Sessions	Frequency of Sessions	Intervention Administrator	Booster Sessions	Study Population
Investigators						
<i>Social Influences Model</i>						
Coe et al., 1982	7 or 8	8	Weekly or twice weekly	Program staff	No	30-40
Jason et al., 1982	9	7	Weekly	Program staff	No	149
Spitzzeri and Jason, 1979	9	10	Weekly	Program staff	No	61
Evans, 1976	7	4	Consecutive days	Peers	No	750
Pentz et al., 1989b	6-7	10		Peers, parents, and teachers	Yes	1,122
Ellickson and Bell, 1990	7-8	8	Weekly	Health educators, peers, and teachers	Yes	3,852
Best et al., 1984	6	6	Weekly	Program staff	Yes	654
Flay et al., 1983	6	6	Weekly	Program staff	Yes	653
Flay et al., 1987	7	5	Consecutive days	Teacher	No	4,891
<i>Cognitive Behavioral Model</i>						
Gilchrist et al., 1986	5-6	8		Peers and program staff	No	741
Schinke et al., 1985a	6	10	Weekly	Program staff	No	689
Schinke and Gilchrist, 1984	6	8	Semiweekly	Program staff	No	234
Gilchrist et al., 1989	6	10		Health educators	No	882
<i>Life Skills Model</i>						
Tell et al., 1984	5-7	10	Over 2 years	Peers and program staff	No	298
Botvin et al., 1983	7	15	Weekly or daily	Teachers	Yes	902
Bush et al., 1989	4-6	4	Over school year	Teachers	No	1,234
Botvin et al., 1980	8-10	10	Weekly	Program staff	No	281
Walter et al., 1989	4-9	Throughout school year	Weekly	Teachers	Yes	1,105
Botvin et al., 1984	7	20	Weekly	Older peers and teachers	No	1,311
Botvin and Eng, 1982	7	12	Weekly	Older peers	No	426

techniques in eight 1-hour sessions during regular school hours with the teacher present. The intervention strategies of Jason et al. (1982) were delivered by graduate psychology students in six weekly sessions lasting about 30 minutes each. Spitzzeri and Jason (1979) used clinical psychology graduate students, divided treatment classes into groups of 10, and engaged in role-playing scenes that lasted 5 to 10 minutes and were followed by 15 to 20 minutes of discussion.

A number of studies have used teachers to deliver the intervention program. Biglan et al. (1987a and 1987b) had science or health teachers present instruction sessions that ran for 3 or 4 consecutive days and were followed by a booster session, 2 weeks later, which emphasized refusal skills. Colquhoun and Cullen (1981) used a program of six 75-minute sessions conducted by teachers, with participation from local general practitioners. Colquhoun and Cullen reported smoking declines for 12-year-old boys from 11 percent to 4 percent 1 year later and, in 13- to 14-year-olds, declines from 20 percent to 14 percent in boys and 31 percent to 26 percent in girls.

Flay and coworkers (1987) delivered a 5-day classroom curriculum that was taught the same week that a local television station aired five 5-minute smoking prevention segments. There were an additional five 5-minute television segments on smoking cessation the following week. Pentz and colleagues (1989a and 1989b) had teachers deliver the intervention program in health, science, or social studies classes and reinforced classroom instruction with 10 homework sessions involving interviews and role-playing with parents and families.

A number of studies have combined staff or teacher delivery of program material with the assistance of a student peer. Arkin and colleagues (1981) involved all seventh grade classes of eight junior high schools (3,206 students at the program's start). Each seventh grade class nominated classmates who they believed would be effective leaders. The peer leaders directed discussions, provided feedback, and helped students to develop counterarguments. Ellickson and Bell (1990) used health educators to deliver the program to seventh graders in 10 schools, and teen leaders assisted adult teachers in 10 other schools. Perry and coworkers (1989), in a study of strategies to promote cardiovascular health, used same-age peer leaders in a smoking cessation program aimed at seventh graders. Murray and colleagues (1984, 1987, 1988, and 1989) employed a combination of teacher-led and peer-led intervention sessions and then tracked the participants for 6 years. They reported a significant reduction of smoking onset at 1 year, but the effect diminished with the passage of time.

Positive effects were reported also when the prevention program was delivered to elementary school students (Best et al., 1984; Dielman et al., 1985; Flay et al., 1983 and 1985). Best and colleagues (1984) included sixth graders from 22 schools in a social influences smoking prevention program. At the end of the eighth grade, 47 percent of never-smokers in the control group still had not tried smoking, and 60 percent of the treatment group never-smokers still had not smoked.

Johnson et al. (1986) delivered a social approach curriculum and a health approach curriculum aimed at Los Angeles area high school students. They concluded that social influence resistance training helps to reduce transitions to higher use by smoking experimenters. Health education was most valuable in preventing initial experimentation among those who were nonsmokers prior to the study.

Perry and coworkers (1980b), in the area of Stanford, California, examined a smoking prevention and cessation program delivered in regular 10th grade health education classes. On consecutive days during the fall semester, students received four 45-minute classes that covered handling social pressures to smoke, identifying and discussing the targets of cigarette advertisements, and brainstorming about how to help others remain nonsmokers or quit smoking. The students also measured their blood pressure, pulse rate, lung capacity, skin temperature, and carbon monoxide levels in breath. At the end of the semester, students in the program were more knowledgeable about the immediate physiological effects of smoking and about the best methods to quit and prevent others from smoking.

In a similar study, Perry and colleagues (1983) had 20 classes of 10th graders participate in a comparison of three treatment programs: the first was the social consequences of smoking; the second was the immediate and long-term physiological effects of smoking; and the third was the long-term health effects of smoking. The investigators cautioned that no single program appeared to be more effective than the other two, although the combined effect of all three programs was a 23 percent reduction of regular weekly smoking at 2-month followup.

Not all researchers have been able to replicate earlier reports (Best et al., 1988). Clarke and associates (1986) concluded that interventions led by program staff, which were "relatively light, short-term interventions," had little effect in an environment filled with powerful prosmoking messages by media, older peers, and adult role models.

Failure to achieve significant results in programs led by teachers have been reported by Lloyd et al. (1983), Clarke et al. (1986), and Burke et al. (1987). Lloyd and coworkers (1983)

surveyed teachers about their own smoking habits, attitudes toward smoking, and prior use of smoking prevention material. Teachers who rated lowest on this implementation scale had students whose test results for knowledge and behavior changes were similar to those for control students. Fisher et al. (1985), Clarke et al. (1986), and Burke et al. (1987) reported inconclusive results with programs that used a combination of teachers or program staff and peer leaders.

Several investigators have used mass media to supplement the more typical delivery approaches. Arkin et al. (1981) followed students who had received a social pressures curriculum and were nonsmokers at baseline. At followup, the percentages of students who were still nonsmokers for the adult-led sessions with media, peer-led with media, and peer-led without media were 82.1 percent, 81.0 percent, and 88.6 percent, respectively (students who received a standard curriculum were 69 percent nonsmokers). The addition of mass media did not provide a significant benefit in this study.

Murray et al. (1984, 1987, and 1988) reported similar results, in that adding videotape supplements to the social influences curriculum provided no additional benefits. Johnson et al. (1986) used a social influences curriculum to test the effect of recognizable compared with unfamiliar media models and reported no effects of the media models for any onset category or for quitting.

*Complementary delivery channels.* Biglan and associates (1987a) included a set of four messages mailed to the parents of seventh grade students. The object of the messages was to help reinforce refusal skills, health effects, and commitment to non-smoking. The messages also tried to encourage parents to discuss their views of smoking with their children and to set family rules about smoking. The first message was mailed at the end of the school intervention, and subsequent messages at 2, 4, and 6 weeks thereafter. The investigators concluded that messages to and through parents did not affect the outcome.

Positive effects have been reported, though, by some programs that included parent activities and mass media programming as complements to the school-based intervention (Flay et al., 1987; Pentz et al., 1989a and 1989b). Pentz and colleagues (1989a) included, as part of their intervention program, homework sessions that included interviewing parents and family members about family rules on drugs, techniques to avoid drug use, and how families can counteract media and peer influences.

In a related study, Pentz and associates (1989b) included a parent program that consisted of three to six organizational meetings per year, support activities for the school, and an

educational seminar for all parents. In addition, there was a 1-day workshop each year for school principals, parent group representatives, and student leaders. The training emphasized changing school policy toward prevention education, smoking in and around schools, and providing support skills for parent-child communication and prevention. Thirty-two parents were involved in delivering the parent components of this intervention program.

*Complementary target outcomes.* Reductions in tobacco use have been reported by social influences model programs aimed at general substance use (Ellickson and Bell, 1990; Hansen et al., 1988; Pentz et al., 1989a and 1989b). These studies aimed to reduce adolescents' use of drugs—tobacco, alcohol, and marijuana. In a study that focused on cardiovascular risk factors, Perry and colleagues (1989) reported that, after the fifth year of a school-based health education program, 13.1 percent of the educated group were current smokers, in contrast to 22.7 percent of controls.

In a study by Hansen and coworkers (1988), seventh grade students were provided with social pressure resistance training and were tested prior to training and at 12 and 24 months after training. The initiation of smoking was lower in trained students than among controls: 13.0 and 11.8 percent versus 18.2 and 17.8 percent at 12- and 24-month followup testing. The most significant effect was inhibition of the move to heavier smoking. At the level of five or more cigarettes in the preceding 30 days, the reduction was about two-thirds at 12 months (1.7 versus 5.3 percent for controls) and three-fourths at 24 months (1.4 versus 6.0 percent for controls).

Ellickson and Bell (1990) reported a reduction in the levels of cigarette use that signal heavier smoking. After eighth grade booster lessons, weekly smoking declined in one group by almost 50 percent. Ellickson and Bell suggest that booster lessons are important for maintaining and reinforcing earlier intervention efforts. However, they also suggest that early cigarette smokers "need a more aggressive program than that offered by the social influences model alone."

*Long-term followup.* The only long-term followup studies based on the social influences model reported no program effects enduring beyond high school (e.g., Murray et al., 1989), even if booster sessions were included (Flay et al., 1989). Observed effects were maintained, however, up to 4 years after the conclusion of a program with seventh graders (Murray et al., 1988).

*Current activities.* Researchers at the Oregon Research Institute are involved in a large-scale study of a variation on the social influences model that includes a much stronger

behavior-analytic focus than previous efforts. It differs from many previous efforts in that (1) it is a multiple grade-level intervention; (2) it relies heavily on videotaped material to present information and prompt discussion and training in pressure resistance skills; and (3) it addresses a wider range of risk-taking activities, including alcohol and marijuana use and behaviors such as shoplifting (Biglan et al., 1988). Results at 1 year were encouraging, at least among baseline ever-smokers (Ary et al., 1990).

At the Fred Hutchinson Cancer Research Center in Seattle, researchers are involved in a large-scale study of a social influences model variation. It is delivered annually in grades 3 through 10, is delivered by teachers, and includes a parent component; however, it remains focused solely on tobacco use (A. Peterson, telephone conversation).

Researchers at the New England Research Institute are testing another variation in a Hispanic population. Their intervention focuses on family and advertising issues and includes a video and discussion component designed to involve family members and neighbors in the school-based prevention program (S. McGraw, telephone conversation).

In Minnesota, researchers are testing the effectiveness of statewide legislation designed to encourage schools to adopt social-influences-based programs to prevent tobacco use. The state legislature is providing financial support to schools that adopt such programs, and the research will compare tobacco use by adolescents in Minnesota and in Wisconsin, to determine whether the smoking rate declines in Minnesota as a result of the legislation. The study also includes a randomized trial designed to evaluate the three programs that have been adopted most widely as a result of the 1985 legislation (Murray et al., 1988).

Researchers at the University of Southern California and the University of Chicago are testing a combination of television, family involvement, and school-based programming for their effect on tobacco use (Flay et al., 1988). Researchers in Vermont also are evaluating a school-based versus a school-plus-mass media program (Worden et al., 1988). Evans and colleagues at the University of Houston are attempting to construct a psychosocial profile of the quickly accelerated heavy smoker relative to the more slowly accelerated moderate or heavy smoker (Evans et al., 1991). They are applying the psychosocial model developed during their work on cigarette smoking to the problem of smokeless tobacco use (Evans and Raines, 1990), with Little League Baseball players as a study population. They are also evaluating the potential contributions to the psychosocial model of factors such as gender

(Evans et al., 1990), ethnicity (Getz and Evans, 1989), self-efficacy (Getz, 1988), and smoking by others, including parents, older siblings, and peers (Cardozo, 1989; Getz et al., 1990).

Evans and associates also have responded to feedback from teachers and administrators who suggest that many useful prevention programs demand more curriculum time and teacher training time than can be allotted. They are developing and testing a compact, 2-week program that requires minimal training and preparation time by classroom teachers. The "Little Red Notebook" program is based on the social influences model and includes exercises in decision-making, role-playing, and rehearsal; self-control methods; reinforcement of pressure resistance skills; and learning to use relevant community service agencies. Each section includes a step-by-step teacher's guide and copy masters for all materials used in the unit. Although more extensive evaluation is needed, there is some evidence of modest results related to decreased use of cigarettes, smokeless tobacco, and alcohol among seventh grade students (Cardozo, 1989; Evans, 1990; Evans et al., 1989).

Cognitive Behavioral Model

*Program variations.* Gilchrist and Schinke (1984), in a study with sixth grade students, used self-control skills for smoking prevention and reported that self-control students who reported ever smoking rose only 3.6 percent over baseline after 1 year; control condition students rose 39.3 percent in that same year. These students learned a problem-solving model called SODAS, which instructs students to do the following:

- Stop—think about what they are doing;
- Options—think about their choices;
- Decide—choose the best option;
- Act—make that option happen; and
- Self-praise—reward themselves for making the right decision.

Gilchrist and colleagues (1986) evaluated the self-control process with middle school subjects. At a 15-month followup survey, fewer self-control skills students than controls reported smoking one or more cigarettes for the previous week.

Glynn and coworkers (1985), working with sixth through eighth graders, described the stage model, which states that becoming a smoker is a lengthy, complex process with four stages. The first stage is the preparatory stage, in which adolescents first develop attitudes toward cigarettes and smoking. In the second stage of initiation, the adolescent smokes between one and three cigarettes. In the third stage, becoming a smoker, smoking is irregular and adolescents do not define themselves as smokers. The final stage is maintenance, when regular smoking has begun and the image of a smoker has been

Table 3  
The stage model and smoking motives

	Smoking Motives		
	Social Compliance	Affect Regulation	Self-Definition
<b>Stages</b>			
Preparatory	Need for social approval	Use of foods, drinks, and over-the-counter medications to regulate emotional state	Need to rebel
Initiation	Peer pressure, social initiation, nonspecific curiosity	Curiosity about mood-altering properties of cigarettes	Need for impression management (i.e., how one appears to others)
Becoming	Continuing social influences	Positive evaluation of sensations produced by smoking	Is an instant adopter and skips this stage
Maintenance	Continuing social influences, positive evaluation of sensations produced by smoking	Establishment of a link between smoking and affective state of sensations produced by smoking	Satisfaction with projected image, positive evaluation

*Adapted from Glynn et al. (1985).*

adopted. Table 3 shows how the stage model depicts factors that influence adolescents at different smoking stages.

Schinke and associates (1985a) used graduate social workers to provide skills intervention and information intervention to sixth graders. At 6, 12, and 24 months after the intervention, the skills students had a lower percentage of smoking than did the information-only and the control students. A four-step chain in the skill-building interventions—stop, think, decide, and act—was used by Schinke and coworkers (1985b).

Schinke and Gilchrist (1984, 1985, and 1986) have conducted several studies that were led by project staff using the cognitive behavioral technique. In 1984, the investigators reported that students in the skills-building condition, when

compared with students in an attitude modification condition or with controls, had larger gains at followup testing for identifying healthy solutions, encouraging nonsmoking, and anticipating negative consequences of tobacco use. Pentz (1983) reported positive results with a combination of teacher and peer leader administration techniques.

Beneficial effects were reported when the program was delivered to elementary school students, rather than the usual delivery of psychosocial prevention programs to seventh or eighth grade students (Gilchrist and Schinke, 1984; Gilchrist et al., 1986; Schinke et al., 1985a, 1985b, 1986a, 1986b, and 1988a; Schinke and Gilchrist, 1984, 1985, and 1986). Schinke and colleagues (1986b), working with sixth graders, taught problem-solving, self-instruction, and communication skills. When compared with students in a health education program, students in this study had better knowledge scores and non-smoking intentions. Schinke and coworkers (1986a and 1988a) reported that, in a study that began with students in the fifth and sixth grades, students showed lower rates for both smoking and smokeless tobacco use.

Native American adolescents are a particularly vulnerable population for abuse of substances, including tobacco, according to results obtained by Schinke and colleagues (1988b). At 6-month followup, the treatment group reported less use of both smoked and smokeless tobacco during the previous 14 days. However, because of the small number of subjects ( $n = 61$ ) and the short period of followup, the authors advise a cautious interpretation of their results.

Failures to duplicate results of earlier studies have been reported for studies with high-risk girls (Gilchrist et al., 1989). Gilchrist and associates reported the following data for high- and low-risk girls and boys at a 24-month followup survey. The percentage of weekly smokers in the high-risk girls category was 9.1 percent; for low-risk girls, weekly smokers were 3.6 percent; for high-risk boys, 7.3 percent; and for low-risk boys, 4.8 percent. The weekly smoking rate for high-risk girls was significantly higher than for any other intervention category and was similar to the high-risk girls in the control group (10.2 percent reporting weekly smoking).

Gilchrist and associates (1989) suggest that females begin and continue smoking for different reasons than do males. Young female smokers tend to be more socially competent and self-confident than their male counterparts and do not smoke for social coping purposes or to demonstrate assertiveness. Therefore, teaching refusal and social competence skills may be less useful and relevant for females than for males, and thus have less effect.

A more appropriate technique may require less attention to skills training and more to self-definition and self-expression. In addition, tension reduction and information on weight control methods, because smoking is perceived to be valuable for weight control, could prove to be more relevant to young female smokers (Gilchrist et al., 1989).

*Complementary delivery channels.* The programs based on the cognitive behavioral model have been exclusively school-based. Thus, there are no reports of investigation of complementary channels for program delivery.

*Complementary target outcomes.* Positive effects of reducing tobacco use have been reported by programs aimed at general substance use (Pentz, 1983; Schinke et al., 1988b). Such programs have not targeted other health outcomes, however.

*Long-term followup.* There have been no published reports from followup studies beyond 2 years for programs based on the cognitive behavioral model.

*Current activities.* Researchers at Columbia University are testing a variation of the cognitive behavioral model in a high-risk population (S. Schinke, telephone conversation). Adolescents at high risk for smoking often have been unaffected by intervention efforts in the past, and this remains an important area for research. The Columbia group employs the basic cognitive behavioral model but has modified the role models and scenarios to be more appropriate for high-risk youth. The investigators also have added a component to address values on deviance.

## Life Skills Model

*Program variations.* Positive effects have been reported when the life skills program was delivered by the project staff (Tell et al., 1984), by teachers (Botvin et al., 1983, 1989a, and 1989b; Bush et al., 1989; Vartiainen et al., 1983, 1986, and 1990; Walter et al., 1986, 1988, and 1989), and by a combination of teachers or staff and peer leaders (Botvin et al., 1984; Tell et al., 1984; Vartiainen et al., 1983, 1986, and 1990). The smoking prevention curriculum for one cohort of the study by Tell and coworkers is shown in Table 4. Tell and associates provided this social skills training in a 10-session curriculum that began in September 1979 and ended in February 1981.

Botvin and colleagues (1989a) used a psychosocial approach with black junior high students. The study used 12 intervention sessions of 45 minutes each. In addition, an internal review committee of black researchers (a psychologist and two health educators) reviewed the material to make certain that the language, reading level, examples, and underlying concepts were appropriate for black youth. An external review group of black seventh grade students and outside

Table 4  
**A program variation of the life skills model**

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Session	Topics
September 1979	Personal commitment and discussion of social pressures.
September 1979	Pressure resistance training. Student-led role-playing.
November 1979	Social pressures and arguments against smoking.
March 1980	Coping with social anxiety.
May 1980	Pressure resistance training. Student-led talks about the harmful effects of smoking.
October 1980	Smoking: self-pollution and waste of resources. Smoking as a form of self-pollution and growing tobacco as a waste of agricultural resources were discussed.
November 1980	Passive smoking. Second-hand smoke, parental smoking, peer pressure at youth clubs were discussed.
December 1980	Long-term effects of smoking and marketing of tobacco. Cancer and cardiovascular diseases relating to smoking and comparison of selling tobacco in Third World countries versus selling it in Norway were discussed.
January 1981	Social and health aspects of smoking.
February 1981	It is your choice. A film on alcohol consumption was shown, and drinking and parallel smoking pressures were discussed.

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*Adapted from Tell et al. (1984). Sessions were 45 minutes in length.*

experts with expertise with black youth was also formed. The main purpose of the study was to explore the feasibility of applying the life skills training model, previously used with middle-class white youth, to urban black youth. The overall rate of smoking during the most recent month of the study was down by 56 percent, although regular smoking did not appear to be affected.

Bush and coworkers (1989) identified problems that may affect most intervention studies for urban black youth: meeting the parental consent requirement, lack of true controls, variations in teacher effectiveness, frequent student transfers, isolation of the program within schools, data collection procedures, and lack of teacher support for the program. For example, at the seventh grade level, all of the health teachers were smokers, and their effectiveness therefore came into question. In addition, it was difficult for the research team to judge the effect of teachers as role models because of incomplete attendance at teacher training sessions and because there was some question about whether the teachers adhered to the curriculum.

Failures to duplicate results have been reported for studies with teacher-administered life skills programs (Botvin et al., 1984), particularly when the teachers received inadequate training (Botvin et al., 1989b; Tortu and Botvin, 1989). Tortu and Botvin (1989) cautioned that poor implementation can be misinterpreted as program failure. Therefore, to help ensure proper implementation of programs, effective teacher training must accompany teacher-administered programs. The training must include the theory underlying the program, demonstrations of skills needed to administer the program, practice of the new skills, and feedback and coaching from project staff. The social skills programs stress that students learn decision-making skills, assertiveness, and anxiety reduction. These skills require classroom techniques that differ from traditional teaching methods, for example, the practice of adolescent skills through role-playing (Tortu and Botvin, 1989).

Additional benefits have been reported when the initial intervention is followed by a booster program. Botvin et al. (1983), in an intervention program with seventh grade students, reported 60 percent fewer new regular smokers than when the same intervention program was used without booster sessions. Furthermore, the eight booster sessions, which took place in the second year of the program, resulted in 87 percent less regular new smoking than among controls.

Positive effects have been seen also when the intervention continues over several years (Bush et al., 1989; Tell et al. 1984; Walter et al., 1986, 1988, and 1989). Walter and associates began a study of coronary heart disease prevention with a baseline population of fourth graders. Each year from the fourth to the ninth grade, students received a teacher-delivered curriculum that included material designed to prevent cigarette smoking. After 6 years, the rate of initiation of cigarette smoking was significantly less (by 73 percent) than in the non-intervention schools.

By comparison, in a condensed timeframe, Botvin and colleagues (1983) conducted the life skills training program on consecutive days and completed the program in about 1 month, in addition to carrying out the usual practice of weekly sessions delivered over the course of a semester or a full school year. They reported that smoking initiation rates were significantly lower in the intensive program than among control students (who received no special prevention activities), according to monthly, weekly, and daily measures.

*Complementary delivery channels.* An intervention program that was delivered within a broad-based and communitywide heart disease prevention program produced positive results (Vartiainen et al., 1983, 1986, and 1990). The North Karelia Youth Project attempted to reduce the factors associated with cardiovascular disease risk, including smoking, serum cholesterol, dietary habits, and blood pressure. The program was begun with a group of students who were 13 years old. In two schools there was an intensive intervention program and in nine others, less intensive intervention; the balance of schools in the community served as controls. The intervention strategy was applied over a 2-year period.

In the first followup survey (Vartiainen et al., 1983), 21 percent of the students were smoking at least monthly in the intensive intervention schools, 19 percent in the less intensive intervention schools, and 29 percent in the control schools. At the second followup survey, these figures were 24, 22, and 34 percent, respectively. Four years after the program's start, the reported rates were 27 percent for the intensive intervention group, 26 percent for the less intensive intervention group, and 37 percent for the control group (Vartiainen et al., 1986). Eight-year followup results indicated that some of the intervention effect had been lost. Preventive effects seemed to have been beneficial only for those who were nonsmokers when the program began.

*Complementary target outcomes.* Effects that reflect reduced use of tobacco have been reported by programs based on the life skills model and directed to general substance use (Botvin et al., 1984) as well as those that aimed at cardiovascular risk factors (Tell et al., 1984; Vartiainen et al., 1983, 1986, and 1990; Walter et al., 1986, 1988, and 1989). Details of these studies are mentioned in previous sections.

*Long-term followup.* Two studies reported followup for more than 2 years beyond the initial life skills intervention. Walter and colleagues (1988 and 1989) reported positive effects at the end of the ninth grade, in a study that included interventions each year from grades 4 through 9. Vartiainen (1986 and 1990) reported positive effects 2 and 6 years after a 2-year intervention was delivered to students in grades 7 through 9.

*Current activities.* At the American Health Foundation, researchers are examining whether the comprehensive life skills model aimed broadly at cardiovascular risk reduction will be more effective for preventing tobacco use than will the targeted application of only those components aimed at substance use (M. Orlandi, telephone conversation). Researchers at Cornell University are exploring even broader applications of the life skills model that would seek to improve skills related to future employment or early sexual behavior (G. Botvin, telephone conversation).

**CLINICAL  
APPROACH  
TO SMOKING  
CONTROL  
Historical Trends**

The major efforts in smoking control have been aimed at the individual smoker—trying to motivate smokers to quit and help them to do so. Such assistance has included formal cessation programs, usually delivered in small groups, and one-to-one direct advice or counseling from a health care provider. More recently, pharmacologic adjuncts (Grabowski and Hall, 1985) have been added to the treatment mix in both settings. This section briefly reviews the research on the effectiveness of clinical approaches and appraises their potential contribution to a comprehensive program to reduce tobacco use.

Research on smoking cessation was initially driven by a clinical perspective. The aim was to develop effective methods that cessation clinics could use with motivated smokers who referred themselves for “treatment,” or that physicians and other health providers could use with their patients. Serious smoking cessation research and service programs have a rather short history, only about 30 years. Even early on there were proponents of both pharmacological approaches and educational-psychological approaches. The early pharmacological strategies were rather primitive by current standards. Although the role of nicotine in the maintenance and cessation of smoking was poorly understood, the notion of replacing or mimicking nicotine’s action was seen as plausible. Much of the early pharmacological research focused on lobeline, presented in over-the-counter products like Bantron and occasionally by injection. Placebo studies yielded fairly convincing demonstrations of lobeline’s lack of efficacy (Kozlowski, 1984).

Cigarette smoking quickly attracted the attention of workers in behavior therapy. Behavioral approaches to smoking cessation tended to reflect current practices or the zeitgeist in behavior therapy rather than deriving from an analysis or understanding of smoking behavior (Lichtenstein, 1982). Smoking was considered to be a learned habit; pharmacological and biobehavioral processes were neglected. Earlier behavioral approaches to smoking featured conditioning methods followed by self-control strategies and tactics that represented behavioral thinking in the 1960’s and early 1970’s. Behavioral approaches in the 1980’s had major cognitive components,

reflecting the interest in cognitive behavioral strategies. Within this general trend, however, behavioral workers generally maintained an empirical attitude and became increasingly sensitive to the developing body of knowledge about both psychosocial and pharmacological processes in smoking behavior. For example, behavioral researchers evolved nicotine-fading (Foxx and Brown, 1979) or brand-switching strategies to deal with pharmacological processes and tended to be sympathetic to nicotine chewing gum as an adjunct to—or even a major component of—cessation programs (e.g., Goldstein et al., 1989).

Another trend in the late 1970's and 1980's was the shift in emphasis from smoking cessation to maintaining abstinence and preventing relapse. The change was sparked by repeated observations that most participants in cessation programs either quit or greatly reduce their smoking, but the majority subsequently relapse—most of them soon after the program ends. Although early programs tended to focus on smoking cessation by the end of the program, considerable program time is now devoted to relapse prevention. Marlatt and Gordon's (1985) book on relapse prevention epitomized this trend. Both behavioral and pharmacological strategies are employed to achieve maintenance and relapse prevention. Smoking cessation now is recognized as a process that encompasses several identifiable stages—from precontemplation to maintenance or relapse (Prochaska et al., 1988). The importance of tailoring cessation materials to the smoker's stage of readiness to change is increasingly recognized, although not yet empirically supported.

Two other noteworthy trends in clinical intervention are interrelated. One is the renewed and vigorous interest in pharmacologic intervention, especially nicotine replacement therapies (Grabowski and Hall, 1985). This thrust is fueled by advances in knowledge about the critical role of nicotine in maintaining smoking behavior and in the quitting or relapse process (US DHHS, 1988), which have paved the way to growing literature on the effectiveness of nicotine polacrilex—both when used with relatively minimal advice and support and when combined with behavioral counseling and group support. The final trend noted is toward briefer clinical interventions delivered in the context of usual medical care (Glynn, 1988; Ockene, 1987a; Russell et al., 1983). This strategy capitalizes on the credibility of physicians (American Cancer Society, 1977), the teachable moments in medical transactions (Vogt et al., 1989), and the possibility for physicians to use pharmacological adjuncts, a familiar treatment modality.

## **Effectiveness of Different Methods**

There are different cessation methods, and it is possible to categorize them in different ways. Schwartz (1987) lists 21 different approaches in his summary table. With the exception of pharmacological strategies and physician advice or counseling approaches—where there has been much activity in the last 5 years—Schwartz's review of specific clinical cessation methods remains valid.

It is also possible to organize cessation methods into general strategies, for example, self-management strategies, aversive strategies, pharmacological strategies, relapse prevention strategies, combined behavioral-pharmacological approaches, and multicomponent strategies (Kamarck and Lichtenstein, 1988). In fact, nearly all clinical interventions are now multicomponent to a significant degree. Table 5, adapted from Lichtenstein and Mermelstein (1984), lists and briefly describes the typical elements in a multicomponent program, which are organized around three program phases: preparation for quitting, initial quitting, and the maintenance of quitting. No one program is likely to use all of these elements. Given the large number of different kinds of studies, the fact that some methods have been evaluated extensively and some very little, and the differences in evaluation criteria, it is difficult to identify the most effective interventions. However, the following conclusions seem defensible.

The research literature generally indicates that more intensive and extensive interventions are more effective than single-strategy or single-session methods. For example, single-strategy interventions have yielded weak results, whereas multicomponent programs (e.g., Lando, 1986; Ockene et al., 1982) have shown the highest quit rates. Good multicomponent programs can yield long-term (1-year) confirmed quit rates of 30 to 40 percent. The intensity of the intervention or number of contacts also seems important. For example, Lando's (1986) 15-session program is among the most effective intervention reported, and the high quit rates reported by Ockene et al. (1982) for the Multiple Risk Factor Intervention Trial are consistent with that conclusion. With respect to physician advice, a meta-analysis reveals that more frequent contacts are associated with higher quit rates (Kottke et al., 1988). Some research in the self-help or minimal assistance realm also indicates that additional prompts, for example, supportive phone calls, enhance effectiveness (Glynn et al., 1990; Orleans et al., 1988).

It is difficult to empirically determine and demonstrate the specific efficacious elements of multicomponent programs. There is undoubtedly a large nonspecific effect in smoking cessation programs. The commitment to attend regular sessions, expectations of help, group or counselor support, and engagement with therapeutic activities (e.g., homework assignments)

**Table 5**  
**Methods used by cessation programs**

Program Phase	Typical Elements
Preparation	<p>Mobilizing client motivation and commitment</p> <ul style="list-style-type: none"> <li>• Deposits contingent on attendance</li> <li>• Review reasons for quitting and benefits of stopping</li> </ul> <p>Self-monitoring; increase awareness of smoking patterns by keeping records*</p> <p>Setting target quit date 1 to 3 weeks ahead*</p> <p>Self-management training</p> <ul style="list-style-type: none"> <li>• Use self-monitoring to identify typical cues for smoking</li> <li>• Identifying substitutes for smoking and alternative nonsmoking behaviors*</li> <li>• Stress management training; relaxation or exercise</li> </ul>
Quitting (usually one of typical elements listed)	<p>Aversive strategies</p> <ul style="list-style-type: none"> <li>• Pairing smoking with electric shock</li> <li>• Rapid smoking—inhaling every 6 to 8 seconds in the clinic until nausea is imminent or satiation—doubling or tripling at-home smoking</li> </ul> <p>Nonaversive strategies</p> <ul style="list-style-type: none"> <li>• Nicotine fading (switching successively to brands with increasingly lower nicotine content)</li> <li>• Target date contract</li> </ul> <p>Pharmacological—Using nicotine replacement methods (e.g., gum, patches) as a temporary substitute</p>
Maintenance	<p>Followup sessions or phone calls</p> <p>Coping skills training*</p> <ul style="list-style-type: none"> <li>• Transfer self-management skills to maintenance by avoiding cues to smoke and using substitutes (e.g., cinnamon sticks, water, deep breathing)</li> <li>• Cognitive behavioral coping: anticipating high-risk situations; planning coping strategies</li> <li>• Coping with slips or lapses; learning from mistakes</li> </ul> <p>Social support</p> <ul style="list-style-type: none"> <li>• Buddy systems</li> <li>• Involving significant others (e.g., spouse)</li> </ul> <p>Pharmacological—Continuing to use nicotine replacement to cope with withdrawal</p>

*\*Found in most programs*

are known to have powerful effects on any behavior problem, including smoking. Attempts at component analysis—determining efficacious and nonefficacious elements—have generally failed (e.g., Lando, 1986); such studies are markedly lacking in statistical power (Glasgow and Lichtenstein, 1987). Similarly, attempts to identify the value of individual components by adding a single *behavioral* strategy such as spouse or partner support to a basic multicomponent program have also been unsuccessful (e.g., Lichtenstein et al., 1986).

The addition of pharmacological adjuncts, notably nicotine chewing gum, to multicomponent cessation programs yields a more consistent and positive picture. Combining nicotine gum and behavioral counseling tends to produce better results than either approach by itself (Goldstein et al., 1989; Hall et al., 1987; Killen et al., 1984).

Both clinical experience and research support the importance of focusing attention on the maintenance or relapse prevention phase of intervention (see Table 5). Although there are some notable examples of the effectiveness of relapse prevention components (Hall et al., 1984; Stevens and Hollis, 1989), there are as many failures (for a summary, see Glasgow and Lichtenstein, 1987). Nevertheless, there remains a consensus that attention to relapse prevention is important. It is plausible, however, that environmental factors, including other people's smoking, are critical to maintenance (Glasgow and Lichtenstein, 1987).

For the individual smoker, conscientious attendance at a multicomponent, small-group, cessation program (including nicotine replacement strategies) is the best possible move toward becoming an ex-smoker. Such a program is likely to produce a 30 percent quit rate at 1-year followup. Although far from the sure thing advertised by some proprietary programs and private practice providers, this is a good result compared with a single attempt at self-quitting (Cohen et al., 1989) or even quitting with the advice and assistance (e.g., prescription of a nicotine chewing gum) of a primary care physician (Glynn, 1988).

## Cessation Clinics

*Limitations of cessation clinics.* Two extensively researched cessation programs illustrate the strengths and weaknesses of the cessation clinic approach. In the 1970's, many programs employed rapid smoking (Lichtenstein et al., 1973; Schmahl et al., 1972), typically accompanied by considerable behavioral counseling and support. Rapid smoking is an aversive procedure wherein the smoker puffs and inhales every 6 to 8 seconds until nausea begins. It is the most frequently studied clinical strategy, accounting for 49 of the 416 trials summarized in Schwartz's comprehensive summary (1987), and its close cousins—satiation

and regular-paced aversive smoking—account for another 39 trials. Quit rates, although quite variable, are often 30 percent or more at followup, which is considered good for cessation programs.

However, the procedure is used sparingly today for several reasons. The accelerated nicotine intake from rapid smoking requires screening and safeguards (Lichtenstein and Glasgow, 1977) and leads to the exclusion of many patients who need assistance. The method also requires close supervision either in one-to-one or in small group settings to monitor possible side effects. Concern about risks with the use of aversive methods makes many providers and consumers wary. Rapid smoking remains a reasonably powerful strategy, but it has a narrow range of application (Lichtenstein, 1982).

The second multicomponent program probably represents the best that formal cessation programs have to offer while again illustrating some inherent limitations. Over a span of 15 years, a multicomponent, nonaversive, 8-week, 15-session program was empirically developed and evaluated (Lando, 1986). (The program originally included satiation smoking—doubling or tripling at-home smoking for a specific period—a cousin of rapid smoking that provokes concerns about similar risk and screening; however, recent research indicates that nicotine fading effectively replaces satiation.) One-year abstinence rates were consistently 30 percent or better. Most importantly, the research team developed a partnership with the Iowa Lung Association, in which association volunteers were trained to deliver the program while the research team continued evaluation and monitoring. The Iowa Lung Association offered nearly 70 such clinics in 1 year (Lando et al., 1989). Thus, an empirically validated cessation clinic was given away to the public sector and disseminated at low cost statewide. However, the intensive nature of the program—15 sessions of 1 hour each—plus the need for trained volunteer leaders limit its applicability. Most smokers will not or cannot make such a behavioral commitment to any cessation clinic.

*Acceptance of cessation clinics.* Cessation clinics are often the initial strategy of antismoking efforts, and they are a tangible resource and an important component of any comprehensive program. It is worthwhile to encourage smokers to attend such clinics, and most cities have clinics that are underused (e.g., offered through local hospitals); however, cessation clinics are not accepted by and will not reach the great majority of smokers. There are several lines of evidence that support this assertion. (1) The great majority of ex-smokers quit or try to quit without the aid of formal programs (Fiore et al., 1990; US DHHS, 1982). (2) Data from surveys indicate that

most smokers prefer self-help or other assistance (e.g., from physicians) in preference to cessation clinics (Gallup Opinion Index, 1974; Owen and Davies, 1990; Schwartz and Dubitzky, 1967). (3) The demand for cessation clinics does not appear great, judging from anecdotal reports of various program recruitment efforts. According to one market research survey, about 1.7 million smokers, a little more than 3 percent of the smoking population, attended some kind of cessation clinic in 1988 (Pierce, 1990). Also, even if the demand increased, there would be many places, for example, rural areas and inner cities, where the supply of cessation clinics would always be inadequate. (4) Stop-smoking programs have not been nearly as successful commercially as their weight-loss counterparts. Schwartz (1987) notes that three national programs established between 1968 and 1971—Smoke Watchers, SmokEnders, and Schick—had reduced operations by 1985.

#### Health Care Provider Interventions

Clinical intervention through health providers offers greater potential to reach smokers. It is estimated that physicians have contact with at least 70 percent of all smokers each year (Ockene, 1987a) and that approximately 38 million of the 53 million adult smokers in the United States could be reached by physicians in the normal course of their medical care. Physicians are seen as a credible source of cessation advice (American Cancer Society, 1977). At the time of a consultation with a physician, patients are sensitized to their health and vulnerability, thus creating a teachable moment that could be used by health providers (Vogt et al., 1989). One NIH publication refers to these as "clinical opportunities" for smoking intervention and provides materials to promote physician involvement in smoking cessation (US DHHS, 1986).

These considerations have given rise to a sizeable body of literature on the effects of physician advice (see reviews by Glynn, 1988; Ockene, 1987b; Pederson, 1982). Compliance with physician advice to quit smoking has been addressed in more than 40 studies. Although the studies vary considerably in focus and methodological rigor, the evidence from randomized trials suggests that physicians who intervene with smokers have a small but measurable impact on public health. Studies of the effectiveness of physician smoking interventions indicate that advice or brief counseling alone can result in patient quit rates of 5 to 10 percent, an outcome of enormous public health significance (US DHHS, 1986). Furthermore, the data suggest that even higher cessation rates can be achieved when physician-patient contacts are more intensive and frequent and when nicotine gum is used also (Fagerstrom, 1984; Glynn, 1988; Wilson et al., 1987). As with most interventions, short-term (1- to 3-month) quit rates tend to be higher; by 1-year followup, significant relapse has occurred.

One cautionary note here is that most placebo-controlled trials indicate that nicotine gum is not effective when prescribed in routine outpatient settings (Hughes et al., 1989; Jamrozik et al., 1984; Lam et al., 1987). It is possible that instruction in the proper use of the gum (S.R. Cummings et al., 1988) has been insufficient. Nicotine gum is effective, however, if accompanied by counseling and support and if careful instructions for using the gum are given (Glynn, 1988). Nicotine replacement via transdermal patches is another promising strategy that both physicians and patients may find convenient. Preliminary data from patch trials are promising.

Surveys indicate that most physicians accept responsibility for dispensing cessation advice (Wechsler et al., 1983) and report that they do dispense such advice (Wechsler et al., 1983; Wells et al., 1986). Although some survey data reflect physicians' pessimism about their efficacy and indicate financial and organizational obstacles (Orleans et al., 1985), several studies have demonstrated that physicians can be motivated to deliver a cessation protocol, at least during the course of a study (e.g., Fagerstrom, 1984; Janz et al., 1987; Wilson et al., 1987). Whether the majority of physicians can be induced to advise or counsel smokers consistently when not motivated and monitored by a research staff remains to be demonstrated. Nevertheless, from a public health perspective, physician interventions have the potential to reach large numbers of smokers.

### **Importance of Clinical Interventions**

Clinical cessation interventions have made substantial contributions to antismoking efforts. Although it is difficult to provide accurate quantitative estimates, cessation clinics have, over the past 25 years, helped several million smokers quit. The American Cancer Society has sponsored cessation clinics based on its own program and materials; the American Lung Association has also sponsored clinics on a more limited basis. Evaluation of these programs (Schwartz, 1987) indicates 1-year quit rates averaging about 20 to 25 percent.

Hospitals, health plans, and health departments are offering cessation programs in increasing numbers. Schwartz (1987) reported a major increase in these programs from 1980 to 1985, and the trend appears to continue. At least two standardized, commercial programs, SmokeLess and Smoke Stoppers, are now licensed to hospitals that offer the services to the community. An estimated 600,000 smokers have completed the SmokEnders program (US DHHS, 1989). Adding in the other major commercial programs, Schick and Smoke Watchers, along with the numerous private practitioners who work with smokers—psychologists, psychiatrists, and hypnotherapists—one can see the significant aggregate impact of such services. They continue to provide a resource for motivated smokers who are unable to quit without help.

Besides individual and group cessation services, clinical interventions in the context of medical care probably have a significant impact on smoking cessation. Many of the self-quitters noted in the 1982 Surgeon General's Report may have been prompted by a physician's advice or warning. National surveys indicate that most physicians accept responsibility for helping patients stop smoking and many provide advice (Ockene, 1987a), although far fewer provide tangible assistance. Survey data from both America (Ockene et al., 1990-1991) and Australia (Owen and Davies, 1990) indicate that smokers see physicians as a major resource.

Another indicator of medical provider impact on smoking cessation comes from prescription sales of nicotine-containing chewing gum. Since nicotine gum was introduced in 1984, an estimated 4 to 6 million smokers, according to one source, have received prescriptions for it (US DHHS, 1989). An industry spokesperson places the estimated number at 8 million and estimates that 95 percent of primary care physicians have prescribed nicotine polacrilex (Nicorette) (Rongey, 1990). Surveys indicate that about two-thirds of these prescriptions are patient initiated. These data also reflect the potential for health care providers to reach far more smokers than can cessation clinics. The availability of nicotine gum and other pharmacologic adjuncts that may be developed can prompt physicians and patients to engage in quitting attempts.

Because clinical interventions reach moderate numbers of smokers and because they are a resource and a source of hope for many dependent smokers, these interventions must be an integral part of any comprehensive plan. Policy and other environmental strategies may shift social norms and change attitudes toward smoking such that some people will quit (or not start) with their own resources; however, many people, especially heavy smokers, will need the assistance of some kind of clinical service. Most smokers will not require a full-service cessation clinic but could profit from advice and support (e.g., a prescription) from a health care provider, a worksite incentive program, or some measure of individual prompting and assistance.

Clinical interventions also have a subtle but important by-product. They help to develop and maintain experts on smoking behavior, who in turn may have influence on public opinion. This influence operates at both local and national levels. A comprehensive community program needs credible spokespersons, and a physician who actively advises and counsels smoking patients becomes such a resource. Similarly, leaders of cessation clinics also develop expertise and credibility as spokespersons.

There is a final contribution of the clinical approach that may be as important as the number of quitters produced. Clinical interventions have been the vehicle for developing knowledge about the process of quitting, understanding the nature of tobacco addiction, and developing useful quitting strategies. For example, cessation clinics have provided information about the effectiveness of nicotine chewing gum (e.g., Russell et al., 1983), the efficacy of combining behavioral and pharmacological strategies (Killen et al., 1990), and the usefulness of nicotine fading or brand switching (Foxx and Brown, 1979). Most of the strategies and tactics embodied in the self-help materials described below were developed in cessation clinics. As new knowledge about smoking develops and spawns new intervention technologies (e.g., nicotine patches), cessation clinics and health providers will provide settings within which they may be evaluated and refined.

## **SELF-HELP APPROACHES**

Most of the estimated 37 million people who have stopped smoking since the Surgeon General's first report on smoking and health have done so without the aid of formal cessation programs (Fiore et al., 1990). Survey data indicate that about one-third of current smokers made a quit attempt within the last year (Harris, 1980), and they express a preference for quitting without the aid of formal cessation programs (Gallup Opinion Index, 1974; Owen and Davies, 1990; Schwartz and Dubitsky, 1967). In recent years, growing recognition of the importance of unaided quitting (US DHHS, 1982) and the relative limitations of clinic-based cessation programs in dealing with what is a public health problem (Epstein et al., 1989) have given rise to substantial literature on unaided or minimally assisted quitting.

Emerging studies suggest that unaided quitting is not a unitary concept, but rather one that requires definition (Lichtenstein and Cohen, 1990). There is no solid line separating clinical cessation from self-help efforts. It is probably more useful to construe a continuum ranging from an intensive, structured clinic to a smoker's making a New Year's resolution and quitting without any materials whatsoever. Self-help studies have reported on the effects of materials received through the mail (Jeffrey et al., 1982), community-wide quitting contests (Glasgow et al., 1985), New Year's resolution quitting (Gritz et al., 1988; Marlatt et al., 1988), persons requesting self-help manuals (K.M. Cummings et al., 1988; Davis et al., 1984), and computer-assisted self-quitting programs (Prue et al., 1990). Unaided quitting efforts have two major defining characteristics: first, the smoker initiates the self-quitting attempt on his or her own initiative or with minimal prompting from a health care provider or health educator; and second, the effort involves no face-to-face counseling or advice from a health professional.

## **Effectiveness of Self-Help Efforts**

Not surprisingly, unaided quitting tends to result in somewhat lower quit rates than those achieved with clinical interventions, although the differences are not large. Point-prevalence quit rates at 1-year followup tend to be in the 10 to 20 percent range (Cohen et al., 1989; Davis et al., 1984; Schwartz, 1987). For continuous quitting, a less frequent but more conservative criterion is used; then, abstinence rates at 1-year followup tend to be in the range of 3 to 5 percent (Cohen et al., 1989; Davis et al., 1984). Cohen and colleagues (1989) included several samples from different areas of the United States and found no differences at 12-month followup between quitters receiving materials (self-help booklets) from the investigator and those who quit completely on their own. Although self-quitting rates are lower than those for more intensive interventions, their cost-effectiveness is probably higher since there is little or no professional time involved (Epstein et al., 1989).

Self-help materials are often used in concert with media or community programs. The media may be used to promote self-help products, as when a volunteer organization uses public service spots to encourage viewers to request a pamphlet or when proprietary companies use media to advertise products such as LifeSign or Cigarrest. The use of telephone cessation hotlines also can be increased through publicity (Ossip-Klein et al., 1984).

Community campaigns have typically made extensive use of self-help approaches. One particularly effective method is a mediated, community-wide, cessation program. Through publicity about a quitting program via television or newspapers, significant numbers of smokers can be induced to make serious quitting attempts (Cummings et al., 1987). Quitting strategies may be provided to participants also through written self-help materials, and prizes for selected quitters (via lottery) may be offered. Self-help materials can also be joined with nicotine polacrilex to increase quit rates (Fortmann et al., 1988; Killen et al., 1990). Finally, physicians prescribing nicotine gum (or pharmacists dispensing it) can provide written materials to help patients deal with the behavioral aspects of smoking.

## **Acceptability of Self-Quitting**

Surveys have found that most smokers prefer indirect or self-help methods rather than formal cessation clinics (Gallup Opinion Index, 1974; Schwartz and Dubitsky, 1967). A recent probability sample from Australia (Owen and Davies, 1990) confirms the lack of interest in cessation groups (6.7 percent) but found considerable interest in "a program through your doctor" (23.7 percent) and "a program through [an]other health professional" (12.5 percent). Unpublished survey data from the Community Intervention Trial for Smoking Cessation

also suggest strong interest in assistance from physicians. This shift toward an interest in more direct or personalized cessation services may be an Australian phenomenon; however, it also may reflect historical changes in smokers. Today's smokers may better recognize their dependency and need for external assistance.

Nevertheless, there is a considerable consumer demand for take-home services or aids. Although no smoking cessation book has reached the nonfiction best seller lists—as is common for diet books—the public consumes millions of free brochures and pamphlets published by the Federal Government and the major voluntary organizations. One Government agency reported distributing over 2.5 million smoking-related items in 1989. It has been estimated that Government and voluntary agencies combined produce 100 *new* smoking and health items each year. The brisk market for commercial products such as Cigarrest and LifeSign also attests to the public's willingness to try promising methods in the privacy of their own homes and offices.

### **Importance of Self-Quitting**

Several considerations make self-help materials a critical element in any comprehensive smoking intervention. Their acceptance by many smokers is a major factor; another factor is their availability, as Government agencies and major voluntary organizations have already created many useful products. For the voluntary organizations, both their mission and their self-interest dictate that they create, update, and disseminate good materials bearing their names; a shortage of good self-help materials is not likely. The great majority of these self-help materials either are free or cost very little. The problem is disseminating or deploying them effectively. A parallel motive drives the private sector; as long as there is the potential to make a profit, self-help products such as LifeSign and Cigarrest will be marketed.

Because self-help materials are acceptable to many smokers, are relatively inexpensive, and can be distributed in settings where smokers naturally are found (medical offices, worksites, stores), they have the potential to reach many more smokers than do clinical interventions. They also offer the opportunity to tailor messages to particular subgroups of smokers in a cost-effective way. Market segmentation can focus on smokers along the lifespan trajectory, such as written materials aimed specifically at adolescents, pregnant women, or mothers of newborns. Alternatively, self-help materials can be focused on various demographic groups or on smokers at different points on the readiness-to-change continuum (Prochaska et al., 1988).

Finally, the presence and publicizing of both nonprofit and proprietary self-help materials increase public awareness of the smoking problem. For example, media advertising and store displays of commercial materials (e.g., LifeSign, Cigarrest) contribute to an environment that reflects public concern about smoking and support for those trying to quit. In summary, specific self-help materials or methods are likely to have only weak effects by themselves, but in combination with media or community programs, they can reach various populations of smokers and are a critical part of any comprehensive smoking reduction program.

## CONCLUSIONS

- Public information campaigns have been successful in increasing awareness of the disease risks associated with smoking and have motivated some smokers to quit; however, they do not create substantial change in the behavior of regular smokers when used as an isolated smoking control strategy.
- School-based education methods have been demonstrated to reduce the prevalence of smoking for several years among adolescents receiving the curricula. This benefit in reduced or delayed initiation of smoking has been demonstrated for programs that treat smoking in conjunction with other drug-use behavior as well as for curricula that deal with smoking alone.
- The best school-based curricula include skills training in dealing with the social environment, and programs that include parent and community involvement are more successful than those that do not.
- Formal cessation clinics have the highest rate of successful long-term cessation of any smoking control strategy, but only a limited number of smokers will participate in such programs.
- Formal cessation clinics, brief personalized interventions by health providers, and the gamut of self-help materials constitute a continuum of services aimed at the individual smoker. When properly integrated in community programs such as the Community Intervention Trial for Smoking Cessation (Pechacek, 1987), they complement one another and offer attractive options for smokers with varying needs and interests.

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