

Chapter 5. Efforts to Reduce Tobacco Use Among Women

Background and Overview of Smoking Cessation Methods 549

Innovations in Smoking Cessation 550

Gender-Specific Similarities and Differences in Motives and Barriers to Stop Smoking 550

Smoking Cessation and Nicotine Addiction Treatment Methods 552

 Unaided Smoking Cessation 552

 Self-Help Programs 553

 Minimal Clinical Interventions 554

 Intensive Clinical Interventions 555

 Pharmacologic Adjuncts 556

 Population-Based Interventions 558

Smoking Cessation Issues Unique Among Women 558

Hormonal Influences 558

 Smoking and Menstrual Cycle 558

 Effects of Oral Contraceptives 561

 Effects of Menopause and Aging on Smoking 562

Pregnancy 562

 Smoking Cessation 563

 Preventing Relapse Before Delivery 563

 Effectiveness in Improving Birth Outcomes and Associated Economic Benefits 564

 Postpartum Smoking 564

Factors of Special Importance Among Women and to Smoking Cessation 565

Weight Control 565

 Behavioral Weight Management Programs 566

 Exercise Programs 567

 Pharmacologic Approaches in Relation to Weight Control 567

Depression 569

 Pathways Linking Depression and Smoking 569

 Antidepressant Interventions in Smoking Treatment 569

 Behavioral Interventions Targeted to Smokers with Mood Disorders 570

Social Support 570

 Gender and Social Support 571

Smoking Cessation in Specific Groups of Women and Girls 572

Adolescent Girls 572

 School-Based Smoking Cessation Programs 572

 Other Smoking Cessation Programs 573

Women Who Smoke Heavily 573

 Characteristics Related to Heavy Smoking 574

 Unassisted Smoking Cessation Among Women Who Smoke Heavily 574

 Cessation Programs for Women Who Smoke Heavily 574

Women of Low Socioeconomic Status 575

 Measures of Low Socioeconomic Status 575

| | |
|---|------------|
| Cessation Programs in Public Health Settings | 576 |
| Effects of Mass Media | 576 |
| Cessation Programs for Pregnant Women of Low Socioeconomic Status | 577 |
| Cessation Activities in Occupational Settings for Women of Low Socioeconomic Status | 578 |
| Minority Women | 578 |
| African American Women | 579 |
| Hispanic Women | 581 |
| American Indian or Alaska Native Women | 582 |
| Asian or Pacific Islander Women | 583 |
| Older Women | 583 |
| Special Health Concerns and Smoking Cessation Needs Among Older Women Who Smoke | 583 |
| Promising Treatment Approaches for Older Women Who Smoke | 583 |
| Programmatic and Policy Approaches to Smoking Cessation | 584 |
| Worksite Programs to Reduce Smoking Among Women | 584 |
| Prevalence of Worksite Smoking Control Interventions | 584 |
| Efficacy of Worksite Interventions for Women Who Smoke | 586 |
| Community-Based Efforts to Reduce Smoking Among Women | 587 |
| Community Studies of Smoking Cessation | 588 |
| Tobacco-Related Policies: Attitudes and Effects | 591 |
| Monitoring Public Tobacco-Related Attitudes | 592 |
| Policies Restricting or Prohibiting Smoking | 592 |
| Pricing and Taxation Policies | 594 |
| Policies Restricting Youth Access to Tobacco | 595 |
| Policies Restricting Advertising and Marketing of Tobacco Products | 596 |
| Smoking Prevention | 597 |
| Current Status of Prevention Research | 597 |
| School-Based Interventions | 597 |
| Community-Based Interventions | 598 |
| Public Health Initiatives | 599 |
| Tobacco Control Advocacy Programs by and for Women | 600 |
| Education and Mobilization | 601 |
| Efforts to Raise Awareness and Encourage Action | 601 |
| Activities to Counter Tobacco Advertising and Sponsorship | 603 |
| Counteradvertising and Mass-Media Campaigns | 603 |
| Women's Magazine Projects | 603 |
| Countering Tobacco Sponsorship of Women's Tennis | 604 |
| Women's Leadership Development and Training | 605 |
| Development of Women's Leadership in Tobacco Control | 605 |
| Development of Tobacco Control Advocates in Women's Organizations | 605 |
| Conclusions | 606 |
| References | 607 |

Background and Overview of Smoking Cessation Methods

The 1980 Surgeon General's report, *The Health Consequences of Smoking for Women*, noted that women might start, continue, and fail to stop smoking for different reasons than do men (U.S. Department of Health and Human Services [USDHHS] 1980). The report concluded that "across all treatments, women have more difficulty giving up smoking than men, both at the end of treatment and at long-term points of measurement" (USDHHS 1980, p. 307). This conclusion was based on a simple analysis of self-reported smoking cessation in 14 studies that reported sufficient data for gender-specific comparisons. The report went on to recommend that further research was needed to identify factors that might contribute to observed outcome differences (e.g., women's greater worries about weight gain and greater putative reliance on smoking to regulate negative affect) and to explore possible interactions between treatment and gender. The report urged that research focus on identification of the differences between the smoking patterns among women and men so that optimal methods could be found to reduce smoking initiation and increase smoking cessation among women.

Much has happened in smoking cessation research since the 1980 report was released. Examination of some of the report's hypothesized differences in smoking cessation between women and men—social support, fear of weight gain, and commitment to health—has been the focus of research in the past 20 years. As several reviewers have noted (Berman and Gritz 1991; Clarke et al. 1993; Solomon and Flynn 1993; Gritz 1994; Marcus et al. 1994; Mermelstein and Borrelli 1995; Gritz et al. 1996; Lando and Gritz 1996), however, questions remain as to whether there are important differences by gender in smoking cessation, with some studies having pointed to differences and others to lack of differences.

During this same period, additional research has been conducted on issues thought to be specific to women (e.g., hormonal influences and depression), on gender-related differences in smoking cessation among specific subgroups of the population (e.g., smokers of low socioeconomic status [SES], those who smoke heavily, and minority group members), and on gender-related differences in response to smoking cessation programs (e.g., worksite programs, community-based programs, and policy changes).

In this chapter, an overview of smoking cessation research is presented. It emphasizes the challenges in understanding and addressing the special needs among women who smoke and in noting differences between women and men who achieve cessation. With the notable exception of cessation methods devised specifically for pregnant women, few approaches have focused expressly on women. Nevertheless, some investigators have occasionally examined and analyzed various treatment outcomes for possible differential effects of programs among women and men. This chapter addresses those differences. Even when gender-specific differences in treatment outcome have been reported, analyses to clarify the factors that might be responsible for the differences have rarely been described. Gender-specific differences in outcome might reflect differences in a wide array of smoking-related factors, including SES, social roles, concerns about weight, hormonal factors, smoking history, physical response to nicotine, motives for smoking cessation, and barriers to smoking cessation (Biener 1987; Clarke et al. 1993; Marcus et al. 1994). If substantive differences in smoking cessation outcomes exist between women and men, the underlying factors that contribute to gender-specific differences in treatment outcome are essential to understanding and identifying new and more successful ways to develop or tailor treatment for women (and men) who smoke. Where such information exists, it is also examined.

Although smoking cessation is the major emphasis of this chapter, little doubt exists that prevention of smoking initiation would be the most efficient way to reduce tobacco use among women. Smoking initiation typically begins in youth—more than 88 percent of smokers tried their first cigarette before age 18 years (USDHHS 1994). Thus, prevention efforts have focused primarily on young people, particularly adolescents. This chapter includes an examination of prevention research activities and their differential effects by gender.

Because women and girls make up only a very small fraction of the nation's smokeless tobacco users (Giovino et al. 1994; Centers for Disease Control and Prevention [CDC] 1995b) (see "Smokeless Tobacco" in Chapter 2) and very little has been done to assess methods to curtail smokeless tobacco use among women, this section focuses on strategies in cigarette

smoking cessation research and treatment strategies. This is not to say that smokeless tobacco use is unimportant; rather, the data available have not provided information on gender-specific differences in cessation programs for smokeless tobacco users. Thus, conclusions cannot be drawn about gender-specific differences in smokeless tobacco use and cessation of use.

Innovations in Smoking Cessation

The past two decades have seen a proliferation of methods of smoking cessation (USDHHS 1990, 2000). Among other developments, new emphasis was given to varied venues to reach women who smoke. Examples include the development and evaluation of innovative programs for prenatal, postpartum, and WIC (Special Supplemental Nutrition Program for Women, Infants, and Children) clinics (e.g., Windsor et al. 1993b; Keintz et al. 1994; Kendrick et al. 1995), worksites (Gritz et al. 1988), health maintenance organizations (HMOs) (Ershoff et al. 1989; Gritz et al. 1992), subsidized housing projects (Manfredi et al. 1992; Lacey et al. 1993), and mass-media messages aimed at women (e.g., Cummings et al. 1989; Davis et al. 1992; CDC 1995a; Mermelstein and Borrelli 1995). Some of this work also explored new avenues for reaching women in underserved minority populations (Manfredi et al. 1992; Lacey et al. 1993).

Other innovations in the past two decades include changes and advances in theoretical approaches to smoking cessation that resulted in new treatment approaches for women who wanted to stop smoking (Prochaska and DiClemente 1983; Popham et al. 1993; Prochaska 1994; Prochaska et al. 1992, 1993). The broad application of the principles of social marketing to population-based smoking cessation efforts (Black et al. 1993; Glanz and Rimer 1995) also led to a new focus on targeting and tailoring treatments, both for early-stage smokers (i.e., those not really thinking about stopping soon) (Lichtenstein 1997; Dijkstra et al. 1998, 1999) and for smokers within defined subgroups, such as minority or ethnic groups and elderly smokers at high risk for smoking or for diseases related to smoking (Dale et al. 1997; Orleans et al. 1998).

Initiatives included efforts to understand and target women in specific occupational, socioeconomic, and racial and ethnic subgroups (Gritz et al. 1988; Manfredi et al. 1992; Lacey et al. 1993; Crittenden et al. 1994) and women at different stages of the life cycle, from adolescence and young adulthood (Weissman et al. 1987; Pirie et al. 1991), to pregnancy and early parenthood (Mullen 1990), through old age (King et al.

1990). Efforts were also made to target women by appealing to their desires to protect children and family members from the effects of environmental tobacco smoke (ETS) (Cummings et al. 1989; Emmons et al. 1994). The initiatives also addressed gender-specific barriers, such as pervasive advertising targeted to women in general (Ernster 1993; Pierce et al. 1994b; CDC 1995a) or to subgroups of women with high stress and low SES (Manfredi et al. 1992; Crittenden et al. 1994), limited social support for stopping smoking (Coppotelli and Orleans 1985; Lacey et al. 1993), stress and negative affect (Biener 1987; Lacey et al. 1993), a need to control weight (Klesges et al. 1991; French et al. 1995; Meyers et al. 1997), or concerns about weight gain after smoking cessation (Sorensen and Pechacek 1987; Pirie et al. 1991; Marcus et al. 1994, 1999). From the recent innovations and the research conducted to date, we have learned much about the factors important to women and to successful smoking cessation. Nevertheless, more research is needed in some areas.

Gender-Specific Similarities and Differences in Motives and Barriers to Stop Smoking

Studies to date have reported no major or consistent differences among women's and men's motivations for wanting to stop smoking, readiness to stop smoking, or general awareness of the harmful health effects of smoking. Nevertheless, current work has suggested that multiple gender-linked biopsychosocial factors that might influence motivation to smoke or that serve as barriers to smoking cessation be taken into account when a comprehensive approach toward tobacco control among women is developed (Waldron 1991; Marcus et al. 1994; Gritz et al. 1998). Further research is needed to increase our understanding of how gender-specific factors affect motivation for and the processes of smoking cessation.

Smokers have given a variety of reasons for wanting to stop smoking, but "health reasons" is the most frequently cited motivation for quitting. An analysis of data from the 1987 National Health Interview Survey (NHIS) Cancer Control Supplement found that the majority of both women and men smokers who tried to quit in the previous five years reported health motives for wanting to quit (both 62 percent) (Gilpin et al. 1992). Curry and associates (1990) reported no gender-related differences in health motives for smoking cessation in a large HMO population of adults. Orleans and associates (1990) found little relationship between gender and the perceived links between smoking and disease among

respondents to the Adult Use of Tobacco Survey (AUTS) aged 50 through 74 years. More women than men, however, rated “future health” (77 vs. 69 percent), “present health” (62 vs. 52 percent), and “the effects of my smoking on others” (40 vs. 31 percent) to be important motives for smoking cessation. Similarly, Lando and associates (1991) found that women were more concerned than men about the health effects of their smoking on others. On the other hand, in a survey of 10 worksites, Sorensen and Pechacek (1987) reported that women smokers were less likely than men smokers to recognize the health benefits of smoking cessation. Also, Brownson and colleagues (1992) found that women (both smokers and non-smokers) in a large Missouri sample were less likely than men to report awareness of the harmful health effects of smoking and exposure to ETS.

Previous Surgeon General’s reports on smoking and health (USDHHS 1988, 1989) emphasized that many women may not be fully informed of important gender-specific health consequences of smoking and recommended educational campaigns publicizing the special health risks from smoking among women (see “Tobacco Control Advocacy Programs by and for Women” later in this chapter). The 1988 Surgeon General’s report further noted that “reliance on cigarettes for bolstering an important, self-selected social image may make some women resistant to educational messages on the health consequences of smoking” (USDHHS 1988, p. 507). The lack of coverage about the harmful effects of smoking and pervasive tobacco advertising in women’s print media (Ernster 1993) (see “Press Self-Censorship in Relation to Cigarette Advertising” in Chapter 4) and possible misconceptions about the relative “safety” of smoking low-tar and low-nicotine cigarettes (USDHHS 1989) may reinforce such an “optimistic bias” among women smokers, who are more likely than men to use such products (USDHHS 2000).

Findings have suggested that women may be particularly concerned about the dangers of their own smoking to children and family members. Cummings and colleagues (1989) developed a media campaign emphasizing the health dangers that a mother’s smoking poses to her children. Smokers were encouraged to make a telephone call to the Cancer Information Service (CIS) of the National Cancer Institute (NCI) for help in stopping smoking. The campaign succeeded in boosting calls to CIS from smokers who were mothers of infants and young children. Gilpin and colleagues (1992) found that young women cited social reasons for smoking cessation slightly but significantly more often than did young men (23.9 vs.

19.3 percent). Reasons included pressure from family or friends (11 vs. 9 percent) and wanting to set a good example for children (4 vs. 2 percent). At both ends of the age spectrum, women reported stronger perceived social pressure to stop smoking than did men (Orleans et al. 1990; Pirie et al. 1991). Curry and colleagues (1990) found no gender-specific differences in cost or social motives for smoking cessation.

Motivating people to stop smoking also involves addressing smokers’ concerns about the difficulties and negative consequences of smoking cessation and bolstering their confidence to stop (Miller and Rollnick 1991). Lando and colleagues (1991) found that women were significantly more likely than men to anticipate difficulty in quitting, to believe that they would still be smoking in five years, and to perceive more barriers to stopping smoking. Although women and men were equally likely to rate themselves as addicted to smoking, significantly more women than men said they would feel tense and irritable if they stopped (79 vs. 73 percent; $p < 0.05$); enjoyed smoking too much to stop (77 vs. 64 percent; $p < 0.001$); expected difficulty concentrating after stopping (45 vs. 36 percent; $p < 0.005$); and anticipated gaining considerable weight after stopping (69 vs. 40 percent; $p < 0.001$) (Lando et al. 1991). Similar patterns were seen among smokers aged 65 years or older in the 1986 AUTS who had tried to stop smoking in the past. Significantly more women than men noted weight gain when they had tried to stop (33 vs. 21 percent) and reported the following reasons for relapse to smoking: worry about weight gain (33 vs. 21 percent), headaches (9 vs. 4 percent), and family pressure to stop smoking (18 vs. 10 percent). In addition, significantly more women than men rated smoking as a valuable aid in weight control (54 vs. 48 percent) and in coping with stress (53 vs. 49 percent) (Orleans et al. 1990).

Few studies have explored possible gender-specific differences in the processes or pathways of smoking cessation (Blake et al. 1989). It may be that women and men smokers in the same study achieve similar outcomes by different routes, benefiting more or less from different treatment components or relying on different cognitive-behavioral and self-change processes. Swan and Denk (1987), for example, followed a sample of 209 women smokers and 172 men smokers who had achieved at least 3 months of abstinence after taking part in formal smoking cessation treatments. The investigators documented virtually identical rates of transition to relapse and subsequent recovery (return to abstinence) among women and men over the 12 months of follow-up. But they found

quite different predictors of relapse among women who had stopped smoking (e.g., unemployment and heightened craving for nicotine) and men who had stopped smoking (e.g., having a father who smoked and the severity of "hassles") (Swan and Denk 1987, p. 544). Few studies have examined differences in preferences for treatment (Lando et al. 1991), or investigated interactions between treatment and gender, to understand whether women and men respond differently to the same treatment (Weissman et al. 1987; Curry et al. 1988; COMMIT Research Group 1995a; Ossip-Klein et al. 1997; Gritz et al. 1998).

A number of gender-linked biopsychosocial factors are potentially important motives for or barriers to smoking cessation among women who smoke. For example, the special medical risks from smoking among women, particularly those related to pregnancy, fertility, use of oral contraceptives, and age at menopause, have long been recognized as unique smoking cessation motives among women (USDHHS 1980, 1989). (See "Menstrual Function, Menopause, and Benign Gynecologic Conditions," "Smoking and Use of Oral Contraceptives" and "Reproductive Outcomes" in Chapter 3, and "Hormonal Influences" later in this chapter). Gender-specific differences in the mechanisms of nicotine addiction have received increasing attention. The results of laboratory studies that examined whether gender-specific differences in nicotine metabolism and sensitivity exist have been conflicting (see "Nicotine Pharmacology and Addiction" in Chapter 3). Data on whether the menstrual cycle phase affects nicotine intake also have been inconsistent, but some evidence has indicated exacerbated tobacco withdrawal symptoms during the premenstrual period (see "Hormonal Influences" later in this chapter).

All of the factors surrounding motivation for smoking cessation, taken collectively, dictate the use of a much wider lens when assessing the unique treatment needs and barriers among women who smoke. This assessment might involve routinely measuring potentially important psychosocial variables that are now seldom measured as covariates or predictors in intervention research, such as income level, number of dependent children and other household members, occupation, source of and access to primary health care, perceived value of health, physical self-esteem (e.g., attractiveness), perceived control over life events, perceived competence, concerns about weight, presence of eating disorders, personality and coping styles, perceived social support or isolation, perceived life stress and stressors (particularly those related to life-cycle changes and to stressful family

and marital transitions and circumstances), job strain, demands of multiple roles, and strain related to particular roles (Cohen et al. 1983; Biener 1987; McGrath et al. 1990; Chesney 1991; Covey et al. 1992; Batten 1993). Whether addressing such factors would increase the likelihood of cessation requires more research.

Smoking Cessation and Nicotine Addiction Treatment Methods

A vast variety of smoking cessation methods are available in the United States (USDHHS 1990, 1991b, 2000; Samet and Coultas 1991; Fiore et al. 2000). The methods range from self-help materials to very intensive clinical approaches to very broad community-based programs. Most women and men who attempt to stop smoking and those who do so successfully, do so on their own with little difference between women and men in long-term quit rates (6 to 12 months). Self-help approaches to cessation, minimal clinical assistance, and intensive clinical assistance also have shown few differences between women and men, although some studies reported that men are more likely to achieve long-term abstinence than are women (Research Committee of the British Thoracic Society 1990; Bjornson et al. 1995). Women are somewhat more likely than men to use formal smoking cessation programs (Fiore et al. 1990; Wagner et al. 1990; Glasgow et al. 1993; Yankelovich Partners 1998; Zhu et al. 2000). Substantial differences appear to exist between women and men in the processes of cessation, with women preferring a more gradual approach to cessation and using more cessation strategies than do men (Blake et al. 1989; Fiore et al. 1990; Lando et al. 1991; Whitlock et al. 1997). Women also reported having more withdrawal symptoms than did men (Pomerleau et al. 1994b; Gritz et al. 1996; Sussman et al. 1998a). One cessation method, use of nicotine replacement therapy, may be less effective among women than among men (Killen et al. 1990b; Hatsukami et al. 1995; Perkins 1996, 1999; Wetter et al. 1999a,b); however, other studies indicated no difference (Hughes 1993; Fiore et al. 1994; Jorenby et al. 1995).

Unaided Smoking Cessation

Fiore and colleagues (1990) found that the vast majority of smokers who had tried to stop reported doing so on their own, although this has changed in recent years with increased use of pharmacologic aids (Yankelovich Partners 1998). The finding held among women as well as among men, although a slightly

higher proportion of women than men (16.8 vs. 13.4 percent) reported using an assisted method to stop smoking (Fiore et al. 1990; Yankelovich Partners 1998). In a study of California smokers, women were 27 percent more likely than men to use assistance (self-help, counseling, nicotine replacement therapy) for smoking cessation. These gender differences remained after adjustment for age, education, ethnicity, and number of cigarettes smoked per day (Zhu et al. 2000). Univariate analysis of the 1986 AUTS data showed that more men than women were successful in smoking cessation. However, in a multivariate logistic regression analysis that controlled for variables of demography and smoking history, gender was not a significant predictor of successfully stopping smoking (Fiore et al. 1990).

Comparable results were seen in other large, population-based studies that used self-reports of smoking cessation. For example, the 1991 NHIS Health Promotion and Disease Prevention Supplement reported that although education, age, and race and ethnicity were significant predictors of adults' attempts to stop smoking and to maintain cessation, gender was not (CDC 1993b). Pirie and colleagues (1991) found that attempting to stop smoking and maintaining abstinence were equally common among women and men in a large Minnesota cohort of young adults, and Salive and colleagues (1992) reported that age-adjusted cessation and relapse rates differed little by gender among smokers aged 65 years or older in three large community cohorts. At variance with these findings, Ward and colleagues (1997) found that among adults who had stopped smoking without assistance, abstinence after one year was significantly greater among men than among women (8.6 vs. 0.0 percent). However, in another longitudinal analysis of smokers who attempted unaided smoking cessation, men who smoked were more likely than women who smoked to achieve initial cessation (1 month) (82 vs. 73 percent); no differences in long-term cessation were found (Marlatt et al. 1988).

In a descriptive comparison of 10 prospective studies of self-quitting, long-term abstinence was calculated among smokers who attempted to stop smoking on their own (Cohen et al. 1989). More than 5,000 smokers participated in the combined studies. Long-term cessation, relapse, and unsuccessful quit attempts were very similar among the studies. A formal meta-analysis of all of the studies did not show a gender effect on either 6-month or 12-month abstinence.

Differences are seen between women and men in the timing of smoking cessation. A higher proportion of women than men had stopped smoking at ages

younger than 40 years, and a higher proportion of men than women had stopped smoking between 50 and 65 years of age. Jarvis (1994) postulated that gender-specific differences in life experiences, such as pregnancy and child rearing, may account for such trends. Alternatively, smoking uptake and quitting among U.S. men preceded that of U.S. women in this century. Thus, more men than women were likely to quit among older generations of smokers. Among recent birth cohorts, however, the patterns of uptake and quitting are more comparable among women and men. Gritz and colleagues (1996) suggested that menopause, with its attendant hormonal changes (leading to behavioral events such as fluctuations in affect or difficulty with weight control) and changes in social roles, provides a barrier to cessation.

Methods of smoking cessation vary somewhat by gender. In a survey of smokers at 10 worksites, Sorensen and Pechacek (1987) found that similar proportions of women smokers (70 percent) and men (73 percent) smokers were planning to change their smoking behavior (stop, cut down, or switch cigarette brand) in the next 12 months, but men were more likely to say they wanted to stop smoking entirely, and women were more likely to report wanting to reduce the number of cigarettes smoked. A similar pattern emerged in a larger Minnesota sample: women and men were equally likely to report intentions to change their smoking behavior in the next year, with men more often choosing to stop entirely and women more often choosing to cut down (Blake et al. 1989). Although women and men reported a similar number of previous attempts to stop smoking, women were also less successful in sustaining their attempts for longer than one week. These investigators concluded that women were more tentative and less committed to stopping smoking entirely and postulated that women may be less confident than men in their ability to stop, as well as less persistent in their efforts.

Self-Help Programs

Numerous self-help interventions have been developed for smoking cessation, including manuals, videotapes, and mass-media programs designed to help smokers stop smoking on their own. Although the effects of self-help programs appear to be small and inconsistent (Fiore et al. 2000), they are appealing because they can be easily disseminated to the vast population of smokers who try to stop on their own each year (Fiore et al. 1990; Curry 1993).

Beginning in the mid-1980s, NCI funded seven large-scale controlled trials to develop and assess maximally effective self-help programs and materials.

These trials reached more than 200,000 smokers directly or indirectly in communities, worksites, hospitals, HMOs, and voluntary associations (Glynn et al. 1990). A summary of the results of the self-help trials (Cohen et al. 1989) indicated that a higher proportion of women smokers than men smokers enrolled, but no gender-specific differences in outcome were found. To date, little is known about the relationship between smokers' use of self-help materials and the outcomes of self-help treatment or about the impact of various treatment formats on program reach or efficacy (Curry 1993).

Few studies have explored gender-specific differences in self-help treatment methods or adjuncts (i.e., brief telephone counseling, tailored feedback, physician advice). Fewer have explored interactions between treatment and gender. A study of two interventions that used self-help materials targeted to older smokers (60 years old) (Ossip-Klein et al. 1997) found an interaction between treatment and gender. Among women, cessation levels were higher among those who received two proactive telephone calls. Among men, however, cessation levels were higher for those who received two mailed prompts to call a stop-smoking hotline. This result suggested that women may be more responsive to personal interaction.

A survey by Lando and associates (1991) also suggested that smoking cessation strategies should be different among women smokers and men smokers. In a study based in one of the Minnesota Heart Health Programs, they reported that women smokers were more interested than men smokers in using filters that successively reduced the amount of nicotine inhaled from a cigarette to help them prepare for smoking cessation.

Several self-help guides and programs have been developed exclusively for women smokers, including pregnant women (Windsor et al. 1985; Ershoff et al. 1989; Mayer et al. 1990), mothers of young children (Cummings et al. 1989; Davis et al. 1992), registered nurses (Gritz et al. 1988), HMO enrollees (Gritz et al. 1992), and women living in a low-SES urban area (Mermelstein and Borrelli 1995). Materials developed for pregnant women have been found to outperform generic materials (Windsor et al. 1985). One self-help study with pregnant smokers suggested that supplying smokers with repeated "cues to action" over time, by mail or phone, would itself have benefit (Ershoff et al. 1989). In a study of nonpregnant mothers of young children, however, cessation levels were similar among young women who used a specially developed tailored guide and among a similar group who

used generic materials (both 12.5 percent) (Cummings et al. 1989; Davis et al. 1992).

Gritz and colleagues (1992) evaluated an intervention for women smokers (identified by survey, not volunteers) in a large HMO population who were mailed a six-week series of self-help booklets on smoking cessation. A comparison group of women smokers did not receive self-help material. The overall point prevalence abstinence (at least 48 hours) among all participants was 19 percent at 18 months, with no difference seen between the treatment group, which received an unsolicited, mailed self-help cessation program, and the control group. A more recent study provided support for using personalized messages with self-help material. In this study (Strecher et al. 1994), 359 adult smokers from a large family practice were interviewed briefly, then randomly assigned to receive either a generic letter on smoking cessation or a tailored letter containing advice geared to the smoker's individual health-related beliefs about the benefits of and barriers to smoking cessation, stage of change, and reasons for past failures to stop smoking. Tailoring health letters to the characteristics of each patient allowed the investigators to focus, in clear detail, only on the information most relevant to each smoker. Among light or moderate smokers, self-reported cessation at four months (adjusted for age, education, and gender) was significantly higher for those receiving tailored information than for those receiving generic letters. No significant differences in intervention effects were found between women and men.

Minimal Clinical Interventions

In the past decade or so, efforts have been made to increase the proportion of primary care providers who routinely advise their patients to stop smoking and assist them in that effort (Ockene 1987; USDHHS 1991a; Fiore et al. 1996, 2000; National Committee for Quality Assurance 1997). The 1991 NHIS Health Promotion and Disease Prevention Supplement found that 70 percent of adult smokers reported at least one visit to a physician in the preceding 12 months, with more than two-thirds reporting more than one visit (CDC 1993a). These statistics led to the projection that an additional one million smokers could be helped to stop smoking each year if primary care providers offered brief counseling to all of their patients who smoke (CDC 1993a).

The proportion of adult smokers who reported ever having been advised by a health care professional to stop smoking increased from 26 percent in 1976 to 56 percent in 1991 (CDC 1993a). In 1992, 52 percent

of smokers who had seen a physician in the previous year reported receiving advice to stop smoking (Tomar et al. 1996). The likelihood of having been counseled to stop smoking was directly related to the number of health care visits reported and was slightly higher among women, who reported slightly more visits to a physician than did men (39 vs. 35 percent). Among smokers who had seen a dentist in the previous year, 24 percent reported they had received advice to stop smoking (Tomar et al. 1996). As was observed for counseling from a physician, the percentage receiving counseling by a dentist was slightly higher among women (27 vs. 22 percent). Tomar and colleagues (1996) noted that either smokers are less likely to remember the advice received from dentists than from physicians, or dentists are less likely to advise their patients to quit smoking. Additionally, the researchers concluded that dentists and physicians may not be maximizing their opportunities to advise patients who use tobacco to quit or may not be adequately communicating to their patients the importance of quitting.

Numerous controlled trials were launched in the mid-1980s to test the efficacy of “minimal contact” medical interventions, which relied on techniques that could easily be integrated into routine care and delivered to all smokers, regardless of their interest in smoking cessation. The emphasis was on brief counseling by a health care provider, supported by self-help materials on smoking cessation and, if appropriate, nicotine replacement therapy. Results of these trials showed that even brief interventions significantly improved patient outcomes (Glynn 1988; Kottke et al. 1988; Fiore et al. 1996, 2000). No gender-related differences were observed in attempts to stop smoking, cessation, or relapse, by 12-month cessation rates among HMO patients exposed to brief physician advice plus a nurse-assisted intervention (Whitlock et al. 1997). Women who tried to stop smoking used more cessation strategies than did men. This finding suggested that the processes of smoking cessation may differ by gender.

Two studies by the British Thoracic Society examined the effects of cessation advice from physicians, with or without other levels of encouragement, among adult patients (mean age, 51 years for women and 50 years for men) with smoking-related symptoms who were referred to either study by their physicians (Research Committee of the British Thoracic Society 1990). No significant interactions between type of intervention and gender were observed in either of the two studies, although one found significantly

higher abstinence at 12-month follow-up among men than among women.

The 1996 publication, *Smoking Cessation, Clinical Practice Guideline* of the Agency for Health Care Policy and Research (AHCPR), and the 2000 U.S. Public Health Service (PHS) update, recommended that tobacco use be treated as a vital sign with no differential treatment guidelines by gender, except for treatment during pregnancy (Fiore et al. 1996, 2000). The PHS guideline states, “Many women are motivated to quit during pregnancy, and health care professionals can take advantage of this motivation by reinforcing the knowledge that cessation will reduce health risks to the fetus and that there are postpartum benefits for both the mother and the child” (Fiore et al. 2000, p. 93). It goes on to state, “Postpartum relapse may be decreased by continued emphasis on the relationship between maternal smoking and poor health outcomes in infants and children” (Fiore et al. 2000, p. 93). Findings from the Lung Health Study suggested that women with smoking-related disease may benefit from specific treatment (Bjornson et al. 1995); however, few minimal clinical interventions have been designed for women smokers in high-risk medical groups, such as women who use oral contraceptives or those with diabetes, heart disease, smoking-related cancer, osteoporosis, obesity, eating disorder, depression, or chemical dependence (Fisher et al. 1990a; Gritz et al. 1993).

Intensive Clinical Interventions

Intensive clinical interventions involve individual or group treatment in multiple sessions. The most successful treatments have been multicomponent cognitive-behavioral programs that incorporate strategies to prepare and motivate smokers to stop smoking (USDHHS 1988, 1989; Lando 1993; Fiore et al. 1996, 2000). Effective strategies vary in their long-term efficacy, from 14.4 percent for social support delivered in the clinical setting to 19.9 percent for rapid smoking, an aversive conditioning technique (Fiore et al. 1996, 2000).

Women are somewhat more likely than men to use intensive treatment programs (Fiore et al. 1990; Yankelovich Partners 1998). Similarly, women have a stronger interest than men in smoking cessation groups that offer mutual support through a buddy system and in treatment meetings over a long period (Lando et al. 1991). A few studies of formal treatment have examined interactions between treatment and gender. Flaxman (1978) found that women fared better with a delayed date to stop smoking than with

immediate cessation, whereas the reverse was true among men. Curry and colleagues (1988) compared two theoretical approaches to smoking cessation: a traditional treatment program that emphasized absolute abstinence, enforced with a contingency contract that required those who smoked after their smoking cessation date to send a check for at least \$15 to an organization or person they disliked, and a relapse prevention program that focused on the gradual acquisition of skills needed to abstain from smoking. Men had greater success with absolute abstinence and contingency contracting, whereas women were more successful in the relapse prevention program. In a small pilot study, Weissman and colleagues (1987) reported similar findings among adolescent smokers. The majority of the boys who took part in a program awarding money for achieving target (nonsmoking) levels of carbon monoxide stopped smoking, but all the girls who were enrolled dropped out and were unsuccessful. These results agreed with other evidence that women prefer a more gradual approach to smoking cessation (Sorensen and Pechacek 1987; Blake et al. 1989; Lando et al. 1991).

Pharmacologic Adjuncts

Pharmacologic approaches to smoking cessation raise a number of issues specific to women (Pomerleau 1996). As outlined in detail in the Surgeon General's report *Reducing Tobacco Use* (USDHHS 2000) and confirmed by the AHCPR and PHS cessation guidelines (Fiore et al. 1996, 2000), a number of effective and promising pharmacotherapies for nicotine addiction have emerged in the past decade: nicotine gum (polacrilex), transdermal nicotine patches, nicotine nasal spray, and oral nicotine inhalers (Hughes 1993; Henningfield 1995; Fiore et al. 1996, 2000; Hughes et al. 1999). Nicotine gum and the patch are approved for over-the-counter use (Hughes et al. 1999). Bupropion, a nonnicotine pharmaceutical, showed success in smoking cessation and was approved by the U.S. Food and Drug Administration (FDA) for smoking cessation (Ferry et al. 1992; Ferris and Cooper 1993; Hurt et al. 1997; Jorenby et al. 1999) (see also "Depression" later in this chapter). Two other formulations, clonidine and the antidepressant nortriptyline, have been recommended as second-line pharmacotherapies, but have not yet been approved by the FDA specifically for this purpose (Fiore et al. 2000). Anxiolytics, benzodiazepines, other antidepressants, beta-blockers, silver acetate, and mecamlamine have been studied but are not recommended for tobacco use treatment (Fiore et al. 2000).

Nicotine gum and patches are the best-studied nicotine replacement medications. Surgeon General's reports on smoking and health (USDHHS 1988, 1989, 2000) and several meta-analyses and reviews have concluded that nicotine gum boosts smoking cessation in minimal contact and intensive treatment programs by as much as 50 to 100 percent (Lam et al. 1987; Cepeda-Benito 1993; Hughes 1993; Tang et al. 1994; Fiore et al. 1996, 2000). Use of the gum alone or with brief medical interventions is beneficial (Fiore et al. 1996, 2000), but the gum probably works best with counseling to guide in proper use and chewing technique (Hughes 1993, 1995). Transdermal nicotine patches are easier to use than nicotine gum, cause fewer side effects that might disrupt appropriate use, and result in higher blood levels of nicotine and more stable replacement of nicotine (Killen et al. 1990b; Fiore et al. 1992; Hughes 1993). Moreover, dosing and weaning schedules are better defined and easier to follow with the patch (Fiore et al. 1992; Henningfield 1995). Both nicotine gum and nicotine patches have been found to reduce withdrawal discomfort after smoking is stopped. Some data suggested that nicotine gum (Killen et al. 1990b; Hatsukami et al. 1995; Perkins 1999) and the nicotine patch (Perkins 1996; Wetter et al. 1999a) may be less effective among women than among men, but other research has not reported differences by gender in their effectiveness (Hughes 1993; Fiore et al. 1994; Jorenby et al. 1995). Nevertheless, nicotine replacement has been shown to have value over placebo among women smokers and thus remains recommended for use (Fiore et al. 2000).

On average, women smoke less than do men, but some studies suggested women are more dependent on nicotine than are men smokers. Women's lower body weight and possibly greater sensitivity to nicotine have been proposed to explain comparable levels of repeated samples of plasma nicotine (Grunberg et al. 1991; Pomerleau et al. 1991a). Other studies reported no gender difference in nicotine dependency after adjustment for the intensity of smoking (Gunn 1986; Svikis et al. 1986; Pirie et al. 1991). Perkins and colleagues (1999) noted that women smokers are less dependent on nicotine than are men and suggested that women's smoking is reinforced by factors other than nicotine. Data from the 1991–1992 National Household Survey on Drug Abuse showed that 81 percent of younger female smokers (aged 12 through 24 years) and 79 percent of older female smokers (aged 25 years) rated themselves as addicted to tobacco on at least one of four different indices of

nicotine addiction, including an inability to cut down on their smoking (CDC 1995a). (See “Nicotine Dependence Among Women and Girls” in Chapter 2 for more data on indicators of nicotine addiction.) The Lung Health Study suggested that men smokers may be less aware than women smokers of nicotine dependence and nicotine deprivation or less willing to admit their dependence (Bjornson et al. 1995). Accordingly, women may be more likely to use nicotine replacement therapies (Fiore et al. 1990; Orleans et al. 1994b; Bjornson et al. 1995; Lando and Gritz 1996).

One intervention study of women found that transdermal nicotine replacement therapy or placebo nicotine replacement therapy was less effective in controlling objective withdrawal symptoms among women than among men (Wetter et al. 1999b). However, self-reports of withdrawal symptoms did not reveal any gender-specific differences.

Other evidence suggested that women remember their withdrawal symptoms as being more severe than do men (Pomerleau et al. 1994b). In a randomized trial of women and men smokers, participants were asked to rate withdrawal symptoms during previous quit attempts and during a current quit attempt. Although no differences were observed between women and men for any current withdrawal symptoms reported, three of four retrospectively assessed withdrawal symptoms (irritability, difficulty concentrating, and increased appetite) were reported significantly more often among women than among men. Gritz and colleagues (1996), in a review of the withdrawal distress literature, noted that women are more likely to report withdrawal symptoms than are men when attempting cessation. They also noted that the relapse rate was higher among women who reported intense withdrawal symptoms than among those who reported fewer withdrawal symptoms. That pattern was not found among men.

Sussman and colleagues (1998a) found that adolescent females were more likely than adolescent males to report having difficulty going a day without smoking and to report relying on cigarettes to improve daily functioning. In another study, physiologic differences between women and men who had recently stopped smoking and were exposed to cues to smoke were examined; women had a higher reactivity to cues than did men (Niaura et al. 1998). In a laboratory study that compared responses to smoking among women and men, Eissenberg and colleagues (1999) reported similar physiologic effects by gender but more sensitivity among women than men to some of the subjective effects of smoking.

Because of uncertainties over the safety of nicotine replacement during pregnancy, FDA has assigned a Pregnancy Category C warning to nicotine gum (“risk cannot be ruled out”) and a Pregnancy Category D warning to transdermal nicotine (“positive evidence of risk”) (Henningfield 1995). Hence, these aids are not routinely prescribed for pregnant or breastfeeding smokers. However, the benefits of nicotine replacement medication may outweigh the risks from smoking among pregnant and lactating mothers (Benowitz 1991; Oncken et al. 1996; Jorenby 1998). Caution is advised because nicotine itself poses risks to the fetus, including neurotoxicity (Slotkin 1998). Therefore, pregnant women should first be encouraged to quit without pharmacotherapy. However, nicotine replacement therapy may be indicated for pregnant women who are unable to quit smoking. If used, doses should be delivered at the lowest effective range, blood levels of nicotine should be monitored, and an intermittent delivery system (such as gum) should be used. More research is needed to determine the effects of nicotine replacement therapy among pregnant women and women using oral contraceptives or estrogen replacement therapy (Pomerleau et al. 1991a).

The action of bupropion (Zyban) is not well understood. Smokers who plan to stop smoking start treatment with bupropion at least 1 week before cessation and take the drug for up to 12 weeks (Hughes et al. 1999). Like nicotine replacement therapy, bupropion doubles smoking cessation rates compared with placebo alone, and one study suggested that a combination of bupropion and the nicotine patch produced cessation rates higher than did either treatment alone (Jorenby et al. 1999). Bupropion works well among smokers with or without a history of depression (see “Depression” later in this chapter), which suggested that its antidepressant effect does not account for its success in smoking cessation. No studies have been published in which the gender-specific effects of bupropion were examined.

Other pharmacologic adjuncts for treatment of tobacco dependence include therapies to block the reinforcing actions of nicotine (e.g., mecamylamine), nonspecific pharmacotherapies aimed at lowering cessation-related stress or depression (e.g., anxiolytics and antidepressants), and therapies for tobacco withdrawal symptoms (e.g., clonidine) (Jarvik and Henningfield 1993; Henningfield 1995; USDHHS 2000). Except for one antidepressant (nortriptyline) and clonidine (Hurt et al. 1997; Hall et al. 1998; Fiore et al. 2000), these approaches have not yet been established

as effective adjuncts to standard behavioral treatments. Gender differences have not been examined.

Population-Based Interventions

A number of population-based intervention programs have been developed and tested. Such programs focus on involving an entire population or subgroup of the population in intervention activities. Worksite programs, for example, seek to involve all worksite smokers in cessation activities, and evaluation is based on the entire worksite population (see "Worksite Programs to Reduce Smoking Among Women" later in this chapter). Interventions in religious organizations use the religious community to foster smoking cessation (see "Minority Women" later in

this chapter). Community intervention programs such as the Community Intervention Trial for Smoking Cessation (COMMIT) seek to provide constant, inescapable messages about the value of smoking cessation (see "Community-Based Efforts to Reduce Smoking Among Women" later in this chapter). Telephone quit lines provide intensive counseling in a format that is easily accessible by smokers. Unlike many of the individual-oriented approaches discussed in this background section, population-based approaches are still somewhat immature. Generalization between programs and between venues is difficult. Nevertheless, as later sections of this chapter show, some promise exists for such population-based approaches for smoking cessation.

Smoking Cessation Issues Unique Among Women

Recent studies have identified numerous gender-related factors and mechanisms that should be studied as predictors of smoking cessation, as well as risk factors for continued smoking or relapse. These factors include issues that are of unique concern among women, such as hormonal influences and pregnancy, as well as barriers to cessation, such as fear of weight gain, lack of social support, and depression. Future research must take into account the entire biopsychosocial domain of factors important in women's smoking and smoking cessation.

Hormonal Influences

Women's lives are biologically punctuated by menarche and menopause, by the monthly cycle of ovulation and bleeding, and by pregnancy and childbirth. These events are accompanied by striking hormonal changes and fluctuations. Many women use exogenous hormones to control their fertility and to modulate the effects of menopause. Furthermore, a minority of women engage in abnormal eating and dieting practices that profoundly dysregulate hormonal patterns (Hetherington and Burnett 1994).

Because nicotine is known to alter mood, cognitive function, and performance, nicotine intake and effects, withdrawal symptoms, and the ability to stop smoking and stay abstinent may all reasonably vary in response to hormonal fluctuations that also affect mood, cognitive function, and performance. For this

reason, looking at women as a single group may obscure differences in women's smoking across the life cycle.

Studies of hormonal influences on smoking are relatively new. Whether nicotine intake varies according to phase of menstrual cycle is unclear; some studies have found no difference by menstrual phase (Pomerleau et al. 1994a; Allen et al. 1996), others have found increased smoking during the premenstruum (Steinberg and Chereck 1989), and others have noted decreased smoking during ovulation (DeBon et al. 1995). Studies that examined the menstrual cycle and effects on smoking withdrawal symptoms are more consistent. On the basis of a small number of studies, women, including those with premenstrual dysphoric disorder, appear to do better in quitting during the luteal phase than in the follicular phase, and withdrawal symptoms appear to be less intense during the luteal phase (O'Hara et al. 1989; Perkins et al. 2000). The effects of hormone replacement therapy (HRT) on smoking are still being investigated.

Smoking and Menstrual Cycle

To date, most studies of the endocrine effects on nicotine addiction and withdrawal have focused on the female smoker with regular menstrual cycles. Important questions about the possible mediating role of menstrual phase-related changes in energy regulation, appetite, and weight; depression; and

vulnerability or resistance to stress among smokers remain largely unexplored.

Nicotine Intake During Menstrual Cycle

Studies of the effects of menstrual phase on smoking have been conducted, under both field and laboratory conditions, and have produced conflicting results. Two investigations conducted under field conditions showed smoking, as measured by number of cigarettes smoked, to be highly stable across the phases of the menstrual cycle (Pomerleau et al. 1994a; Allen et al. 1996); in another study, one-third of the women showed decreased smoking on the day of ovulation (DeBon et al. 1995).

Laboratory studies are less representative of actual smoking than field studies. The laboratory studies conducted to date tend to complicate rather than resolve the issue of nicotine intake during the menstrual cycle. Mello and colleagues (1987) studied women in an inpatient setting for 21 days and reported increased smoking during the premenstruum among 70 percent of participants. In a laboratory study, however, Steinberg and Cherek (1989) found an increase in the number of puffs, total puff duration, or both per session during menses compared with the premenstruum and with all other days combined, with no further phase-related distinctions. Pomerleau and colleagues (1992) conducted a laboratory study in which they measured increments in plasma levels of nicotine after participants smoked a single cigarette, in the context of smoking ad libitum. They found a trend toward increased nicotine intake in the mid-to-late follicular phase.

An interesting finding by Allen and colleagues (1996) is that despite the lack of phase-related differences in nicotine intake during the phases of the menstrual cycle, as evidenced by the record of smoking, 58 percent of the participants believed that they smoked more before menses and only 3 percent believed that they smoked less. Such perceptions may play an important role in planning cessation attempts. Furthermore, to the extent that such expectancies contribute to resistance to treatment, investigations that address this cognitive error may enhance the efficacy of strategies to prevent relapse.

Some of the inconsistencies regarding findings around nicotine intake during the menstrual cycle may be attributable to design limitations, discrepancies in methods and definition of the phases, differences in sample selection, or failure to control for psychopathology. Although more rigorously controlled studies may eventually introduce order into the

current confusing picture, it is reasonably safe to conclude that if phase-related differences in smoking exist among smokers with no psychopathology, they are small and subtle (Pomerleau et al. 1994a). Studies of smoking and the menstrual cycle fall short of the exacting standards recommended. Future studies should include biological verification of menstrual phase and testing over two months or more because of high intercycle variability for many parameters, which may be even greater among smokers than among nonsmokers (Halbreich and Endicott 1985; American Psychiatric Association [APA] 1994; Hornsby et al. 1998; Windham et al. 1999).

Effects of Menstrual Cycle Phase on Tolerance and Sensitivity to Nicotine

Masson (1995) studied cardiovascular effects of controlled doses of nicotine or tobacco smoke as well as acute tolerance (reduced response to a subsequent administration of the same dose) and found no differences among normally menstruating smokers as a function of menstrual phase. Because the primary focus of the study was on users of oral contraceptives, participants were tested during menses and during the premenstruum but not at midcycle. A more recent study (Marks et al. 1999), in which women were tested in four hormonally verified menstrual phases, also showed no significant differences in menstrual phase for physiologic, biochemical, or subjective response to administration of a fixed dose of nicotine. These findings suggested that differential sensitivity to nicotine on the basis of phase is not likely to complicate attempts to stop smoking.

Withdrawal and Abstinence Symptoms During Menstrual Cycle

Although the effects of menstrual phase on actual smoking are negligible, the evidence for effects on withdrawal symptoms has been somewhat more convincing. O'Hara and colleagues (1989) examined withdrawal symptoms among persons who stopped smoking and found that women who stopped during the luteal phase rated their withdrawal symptoms significantly higher than did those who stopped during the follicular phase. In the group overall, highly significant correlations were found between withdrawal scores and ratings of menstrual distress. Although this study used a relatively crude definition of phase, designating the 15 days before onset of bleeding as "luteal" and the remainder of the cycle as "follicular," a subsequent laboratory study replicated this finding (Pomerleau et al. 1992). Similarly, on the basis

of a larger study, Perkins and colleagues (2000) found that the 37 women who quit smoking during the luteal phase were significantly more likely than the 41 women who quit during the follicular phase to experience withdrawal symptoms and to self-report depressive symptoms during their quit week. No differences were observed between the groups during the two-week pre-quit baseline.

Allen and colleagues (1999) failed to detect phase-related differences in withdrawal symptoms. The setting of this study was an inpatient unit, which may have lessened the impact of environmental cues for the withdrawal symptoms. In a study of 166 women smokers who had no history of psychiatric disorders and who reported negative experiences during previous smoking cessation attempts, women with depressive mood as a withdrawal symptom were significantly more likely than women without depressive mood to report changes in mood related to menstrual phase (Pomerleau and Pomerleau 1994). These findings raised the possibility that a history of depressive mood as a withdrawal symptom constitutes a risk factor for menstrual phase-related problems during smoking cessation (see "Depression" later in this chapter).

Withdrawal has also been assessed under conditions of smoking ad libitum (spontaneous, discretionary smoking). One study (Allen et al. 1996) found evidence of withdrawal symptoms peaking in the premenstruum, but at least two other studies showed that withdrawal and menstrual symptoms, although elevated in the premenstruum, are even higher during menses (Pomerleau et al. 1992; DeBon et al. 1995). Until knowledge of smoking during the menstrual cycle is further refined, it is probably most useful to think of the perimenstrual period, including actual bleeding days and the days before the onset of bleeding, as the critical time for exacerbation of withdrawal symptoms.

Beside studies of standard measures of nicotine withdrawal, at least three studies have investigated the possibility that menstrual phase, alone and in interaction with smoking abstinence, affects other potentially relevant variables of behavior. Eck and colleagues (1997) compared food intake and weight changes among women smokers randomly assigned to smoking cessation for 10 days during either the follicular phase or the luteal phase. Food intake increased among both groups of participants during smoking cessation but was unaffected by phase. Weight, however, increased by 1.8 kg in the luteal phase group but remained stable in the follicular

phase group. Pomerleau and colleagues (1994c) administered a battery of tests of motor performance (e.g., finger tapping) and of focused attention to women smokers during menses and during the midluteal phase, under conditions of smoking or overnight abstinence. To evaluate focused attention, the Stroop test was used to examine the ability to remember discordant information about the written name of a color and the color in which the name is written. On the basis of findings in the literature, the investigators hypothesized that superior performance would be seen during the midluteal phase, as observed by Hampson and Kimura (1988). Although the expected performance decrement on the Stroop test was observed after overnight abstinence from smoking, neither menstrual phase nor interaction effects emerged. This finding raised the possibility that the antiestrogenic effects of smoking (Michnovicz et al. 1986; Baron et al. 1990) may attenuate the phase-related differences in performance observed by Hampson and Kimura (1988).

Effects of Menstrual Cycle Phase on Ability to Stop Smoking and Likelihood of Relapse

Although often assumed, the link between the withdrawal experience and the ability to achieve and maintain abstinence from smoking has not been unequivocally established (Hughes and Hatsukami 1986; Kenford et al. 1994). Little is known about whether heightened symptoms in the premenstruum increase the difficulty of maintaining smoking cessation during this time. One study found that women in the premenstrual phase were significantly less successful than either women at midcycle or men in maintaining abstinence for two consecutive days (Craig et al. 1992). Klesges (unpublished data, 1994; see review by Gritz et al. 1996) found that among women who were paid \$150 to stop smoking, 70 percent of those randomly assigned to stop smoking in the follicular phase but only 52 percent in the luteal phase were successful. Duration of abstinence was not reported. Moreover, among women who attempted to stop in the luteal phase, those who succeeded had lower baseline levels of premenstrual distress than those who did not succeed. Other studies, however, found that women were most likely to relapse to smoking during menses, regardless of the phase of the menstrual cycle in which they stopped smoking (Frye et al. 1992; Perkins et al. 2000). Thus, whether women should time smoking cessation attempts so that they do not coincide with the perimenstrual phase is unclear (O'Hara et al. 1989; Perkins et al.

2000). More data on outcome are needed before it can be concluded that starting a cessation attempt during the perimenstruum truly compromises chances of success. Moreover, the value of timing a cessation attempt to avoid the perimenstruum may vary because of individual biological variation in the experience of perimenstrual symptoms.

It has been proposed that endocrine dysregulation induced by smoking and the attendant discomfort might help motivate women to stop smoking (Jensen and Coombs 1994; Charlton and While 1996). Reported effects of smoking that suggested dysregulation of the hypothalamic-pituitary axis include dysmenorrhea among adolescents (Procopé and Timonen 1971; Jensen and Coombs 1994) and among adults (Wood et al. 1979; Sloss and Frerichs 1983; Brown et al. 1988; Hornsby et al. 1998), nausea and vomiting during pregnancy (Gulick et al. 1989), and perimenopausal symptoms, including "hot flashes" (Greenberg et al. 1987; Shaw 1997). Some of these studies relied on retrospective rather than prospective data, and inconsistencies in the literature (e.g., Andersch and Milsom 1982; Gannon et al. 1987) suggested the need for further research. If increased endocrine-related discomfort among women smokers is confirmed, this message should be part of educational efforts aimed at women.

Premenstrual Dysphoric Disorder

Premenstrual dysphoria is a cluster of transient psychological changes consisting of mood swings, anxiety, anger, and depression-like symptoms. Marks and colleagues (1994) examined data from smokers who met the criteria of the *Diagnostic and Statistical Manual of Mental Disorders*, third edition, revised, for late luteal phase dysphoric disorder (APA 1987), which was renamed premenstrual dysphoric disorder in the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (APA 1994). These smokers were asked to keep daily diaries rating menstrual symptoms, smoking, and use of drugs other than nicotine. Significant increases in smoking were observed during menses, with lesser, nonsignificant elevations during the premenstrual phase.

A limitation of the study by Marks and colleagues (1994) was that reports of amount of smoking were collected once at the end of the day by using a relational Likert-type scale rather than a quantitative measure. Moreover, the actual magnitude of the differences in nicotine intake could not be determined and may be quite small in clinical terms. If the findings of this study are confirmed, however, they may

point to strategies that may be particularly helpful among women with premenstrual dysphoria who smoke. For example, severely affected persons may be told that the chances of success may be enhanced by properly timed dietary, pharmacologic, and behavioral interventions (Gonsalves et al. 1991).

Comorbidity of premenstrual dysphoric disorder and depression is considerable (Endicott and Halbreich 1988), and the dysphoric disorder may constitute a subtype of depression (Marks 1992). In view of the well-documented association between depression and smoking (Glassman et al. 1990; Glassman 1993; Kendler et al. 1993) (see "Depression and Other Psychiatric Disorders" in Chapter 3), smoking among women with other forms of depression may also be keyed to the menstrual phase. Among women with a history of depression, the possible role of menstrual phase in precipitating relapse to smoking or depressive episodes after smoking cessation (Covey et al. 1990; Glassman 1993; Dalack et al. 1995) deserves consideration. If this association proves to be valid, recommendations to begin cessation attempts during the follicular phase also may be applicable to women with a history of depression.

Effects of Oral Contraceptives

In 1982–1988, nearly one-fourth of users of oral contraceptives were smokers (Barrett et al. 1994). Cardiovascular responses of oral contraceptive users (Emmons and Weidner 1988; Davis and Matthews 1990) suggested that oral contraceptive use may enhance the reactivity of blood pressure, though not heart rate, to cognitive stress but that its use does not affect reactivity to nicotine. Another study of oral contraceptive users and nonusers, on the other hand, found that the users had larger nicotine-induced increases in heart rate than did nonusers (Masson 1995). These studies suggested differential endocrine-mediated sympathetic activation by nicotine. Masson further observed that oral contraceptive use attenuated the reductions in anxiety after smoking among women who menstruated regularly. Lack of random assignment to oral contraceptive use or nonuse, however, complicates interpretation of all these findings, because self-selection into either category may be associated with personality differences that would also affect reactivity or anxiety. Moreover, a consensus panel recently reviewed the evidence on the health effects of oral contraceptive use and smoking and recommended that women older than 35 years who smoke more than 15 cigarettes per day should not be using oral contraceptives (Schiff et al. 1999).

Furthermore, to minimize as much as possible the risks for stroke and acute myocardial infarction, the panel suggested that oral contraceptives containing very low doses of ethinyl estradiol be given to smokers, especially women smokers older than 35 years of age.

Effects of Menopause and Aging on Smoking

Most, although not all, studies have shown an earlier age at menopause among women who smoke (see "Menstrual Function, Menopause, and Benign Gynecologic Conditions" in Chapter 3). Menopause, on the other hand, may be an obstacle to stopping smoking. Using data collected in Great Britain, Jarvis (1994) argued that although the percentage of persons who have ever smoked and who became former smokers was higher among men than among women, the difference was accounted for almost entirely by differences in the age distribution in the population that had stopped smoking. For ages 16 through 42 years, the relative risk (RR) for smoking cessation was higher among women than among men. Among women and men aged 43 through 50 years, the RR was about equal, and at ages 51 through 57 years, the RR among women compared with men dropped dramatically, rising somewhat at ages 58 through 64 years and at 65 through 70 years and still further at ages 71 years or older, but not reaching equality. The differences were attenuated slightly by adjustment for sociodemographic variables. However, other investigators have suggested that these findings are a "cohort effect" related to historical gender-specific differences in smoking prevalence and quitting (see "Current Prevalence of Smoking" in Chapter 2).

The effect of HRT may be related to menopausal effects on smoking cessation. Greenberg and colleagues (1987) found an excess of smokers among new HRT users and, among smokers, a relationship between the number of cigarettes smoked and the likelihood of HRT use. Because HRT is often prescribed for the symptoms of menopause, the authors speculated that smoking may initiate or aggravate the symptoms for which HRT is prescribed but conceded that several alternative explanations were possible. Possible alternatives include the effect of weight, affect, osteoporosis, SES, and family on the likelihood that HRT will be prescribed; all of these factors also influence or are influenced by smoking (Matthews et al. 1990). Thus, it seems unlikely that this question can be resolved without studies that include random assignment to receive HRT or placebo.

The Women's Health Initiative is a long-term study that will provide opportunities to address these questions. This study has collected and continues to collect information on ever smoking, current smoking, age at smoking initiation, amount smoked, and other smoking-related variables that can be correlated with the study arm to which women are randomly assigned. The arms include HRT in various formulations (e.g., estrogen alone or estrogen and progestin) versus placebo, offering the opportunity to understand the role of HRT in smoking (Women's Health Initiative Protocol for Clinical Trial and Observational Study Components 1998).

Pregnancy

The first published report (Baric et al. 1976) of a smoking cessation program for pregnant women appeared in 1976, 19 years after the first epidemiologic study that linked maternal cigarette smoking and low birth weight (Simpson 1957). The intervention, which consisted of brief advice from a physician to stop smoking, increased self-reported smoking cessation. Since then, numerous intervention trials conducted in diverse populations of pregnant women have been reported; generally, a positive treatment effect is seen (Ershoff et al. 1989; Windsor et al. 1993b; Secker-Walker et al. 1995). The majority of pregnant women (up to 67 percent at 12 months after delivery) begin smoking again after delivery (Sexton et al. 1987; Fingerhut et al. 1990; McBride and Pirie 1990; Mullen et al. 1990; McBride et al. 1992). This finding indicated a need for further research to reduce postpartum relapse.

Previous reviewers who used qualitative and quantitative methods and varying criteria for choosing studies have concluded that prenatal smoking cessation programs are effective (Lumley and Astbury 1989; Mullen 1990; Floyd et al. 1993; Ockene 1993; Dolan-Mullen et al. 1994; O'Campo et al. 1995; Fiore et al. 1996; Windsor et al. 1998). The AHCPR Smoking Cessation Clinical Practice Guideline Panel (Fiore et al. 1996) used its own meta-analysis and a previous meta-analysis (Dolan-Mullen et al. 1994) and concluded that compared with no interventions, intervention during pregnancy increases smoking cessation. A PHS update of the cessation guideline meta-analysis (Fiore et al. 2000) indicated that extended or augmented psychosocial interventions that exceeded minimal physician advice to quit smoking nearly tripled cessation rates among pregnant women.

Smoking Cessation

For this review, studies published in English were identified through bibliographies in reviews of the literature, by experts, and in online databases. Trials were excluded unless they were randomized, controlled trials published between 1976 and 1998 and had biochemically confirmed abstinence. The strong “demand” for pregnant women to “not smoke” may compromise the validity of self-report. For example, two trials found high percentages of deception (28 and 35 percent) in late pregnancy (Windsor et al. 1993b; Kendrick et al. 1995) and differential deception between treatment groups (32 vs. 17 percent) and control groups (49 vs. 32 percent).

Multivariate analyses of the effect of participants’ baseline characteristics on smoking during late pregnancy were conducted in two trials. Findings from the two studies that used relatively intensive treatment and produced a large overall effect suggested that women who had experienced problems during pregnancy (e.g., vomiting or high blood pressure) had lower saliva levels of thiocyanate in their eighth month, indicating a lower level of smoking (Hebel et al. 1985; Ershoff et al. 1989). Such problems may have increased the women’s sense of susceptibility to health effects and may have increased their motivation to stop smoking. Women with more education also had lower levels of thiocyanate during pregnancy. Indicators of higher levels of smoking before and early in pregnancy were related to higher eight-month thiocyanate levels.

Windsor and colleagues (1993b) examined smoking cessation among African American women and among low-income women by using univariate tests. Cessation was significantly higher among African American women in treatment groups than in control groups (18.1 vs. 10.7 percent; $p = 0.03$) and was lower but not significantly different among white women in treatment groups than in control groups (5.2 vs. 10.0 percent; $p = 0.08$). A separate analysis of a subsample, with baseline measures of cotinine level, revealed that virtually all women who stopped smoking were those whose saliva samples contained less than 100 ng of cotinine/mL at the first prenatal visit. Thus, the major effect of programs tested to date appears to be among lighter smokers. This finding was replicated in subsequent studies (Hartmann et al. 1996; Woodby et al. 1999).

Estimates of overall effectiveness of cessation programs for pregnant women may underrepresent the impact of these programs. On the basis of a study with multiple validated measures beginning in the

20th week of pregnancy (Ershoff et al. 1989), the difference between treatment and control groups appeared larger in the second trimester (RR, 2.6) than in the eighth and ninth months (RR, 1.5). Although some relapse occurred among women in the treatment group, the chief reason for the smaller difference in the eighth and ninth months was late smoking cessation in the control group. Thus, one effect of intervention may be to advance cessation that might have occurred later in the pregnancy.

In four trials that reported biochemically verified measures (Sexton and Hebel 1984; Windsor et al. 1985, 1993a; Secker-Walker et al. 1994; Hartmann et al. 1996), the number of cigarettes smoked in the eighth and ninth months of pregnancy was significantly reduced. Evidence has shown that reduction confers some protection for the fetus, whether the reduction is defined as a change in mean level of thiocyanate in the treatment group (Hebel et al. 1988) or as a decrease in cotinine level of 50 percent or more from baseline (Li et al. 1993). Hebel and colleagues (1988), however, found that the benefit was almost entirely restricted to those who achieved total abstinence, were smoking less than one cigarette per day, or were smoking one to five cigarettes per day at eight months’ gestation.

Preventing Relapse Before Delivery

In 1990, Fingerhut and coworkers (1990) reported that across studies, approximately one-fourth of pregnant smokers had stopped smoking before their first prenatal visit. Published estimates have ranged from 15 percent in a largely African American public maternity clinic population (Windsor et al. 1993b) to 42 percent in a primarily white HMO population (Petersen et al. 1992). Although the majority of these “spontaneous quitters” remained free of smoking throughout pregnancy, as many as 33 percent relapsed before delivery, as evidenced by biochemical confirmation in a population receiving no intervention (Lowe et al. 1997).

To date, five randomized trials with biochemical confirmation of nonsmoking in late pregnancy have tested interventions to prevent relapse among persons who had stopped spontaneously. The RRs were all close to 1.0 and were not significant.

Several of these trials have produced a profile of women at high risk for relapse. The risk factors include stopping smoking only within one or two weeks of beginning prenatal care as opposed to earlier, having low confidence in maintaining cessation, being younger, being a heavier smoker before pregnancy,

experiencing less nausea during pregnancy, and having previous children (Quinn et al. 1991; Secker-Walker et al. 1995).

Effectiveness in Improving Birth Outcomes and Associated Economic Benefits

Four studies of whether an intervention during pregnancy increases smoking cessation also evaluated the effect of the cessation intervention on birth outcomes. Although three studies found a lower risk for low birth weight associated with intervention (Sexton and Hebel 1984; Ershoff et al. 1990; Hjalmarson et al. 1991), none of the findings was statistically significant. A fourth study (Secker-Walker et al. 1994) found no lower risks, but it also found no effect of the intervention on smoking cessation. The only study to evaluate the effect of a prenatal smoking cessation program on interuterine growth retardation (Ershoff et al. 1990) found a protective effect that was of borderline statistical significance (RR, 0.2; 95 percent confidence interval [CI], 0.0 to 1.1). Although evaluation of individual cessation programs has not shown a statistically significant reduction in birth outcomes, the relationship between maternal cessation and reduction in low birth weight has been well documented (USDHHS 1990).

The economic benefits of smoking cessation during pregnancy have been estimated in relation to birth outcomes. One analysis, based on a RR of 2.6 for sustained cessation beginning by the 20th week of pregnancy (Ershoff et al. 1989), found a benefit-to-cost ratio of 3:1 (a savings of \$300 in costs for the neonates' initial hospital episode for every \$100 spent on smoking cessation) (Ershoff et al. 1990). A second analysis was based on a RR of 1.7 for smoking cessation, hospital and physician costs at birth, rehospitalization costs in the first year of life, and long-term health care costs, as estimated by the Office of Technology Assessment (Windsor et al. 1993b). In this analysis, the low estimate of the benefit-to-cost ratio was 18:1, and the high estimate was 46:1. A more recent simulation analysis estimated savings that would derive from reductions in the number of low birth weight babies in the United States if smoking prevalence were reduced before or during the first trimester of pregnancy. It found that an annual decline in smoking prevalence of one percentage point would prevent 1,300 low birth weight babies and save \$21 million (in 1995 dollars) in direct medical costs in the first year alone (Lightwood et al. 1999). These analyses suggested that prenatal smoking cessation interventions can provide short-term economic benefit to the sponsoring health care provider.

Postpartum Smoking

Despite successful abstinence for 5 months or more, many women who stop smoking during pregnancy return to smoking within 6 months after the birth. Postpartum relapse has been reported at 32 to 54 percent at six weeks after delivery (Ershoff et al. 1983; Mullen et al. 1990), 45 percent at 3 months (Sexton et al. 1987), 56 to 65 percent at 6 months (Fingerhut et al. 1990; McBride and Pirie 1990; Mullen et al. 1990; McBride et al. 1992), and 67 percent at 12 months (Fingerhut et al. 1990). Most of these studies confirmed cessation biochemically at least once during pregnancy (Ershoff et al. 1983; Sexton et al. 1987; Mullen et al. 1990; McBride et al. 1992).

Conversion of a greater proportion of prenatal abstainers to long-term abstainers is needed. In a test of different ways to prevent women who had abstained from smoking during pregnancy from taking up smoking again in postpartum, 897 pregnant women from two HMOs were enrolled in a study (McBride et al. 1999). Participants received one of three interventions: self-help booklets only, booklet plus prepartum intervention, or booklet plus prepartum and postpartum intervention. All interventions were delivered by mail and telephone. Relapse to smoking at eight weeks postpartum was slightly lower, though not significantly so, among women in the prepartum group (33 percent) and the postpartum group (35 percent) than among women in the self-help booklet only group (44 percent, $p = 0.09$). Among women who received the postpartum intervention, rate of relapse to smoking was slower; however, at 12 months postpartum the three groups had the same rate of abstinence from smoking. Similarly, little success in long-term abstinence has been reported from cessation programs for mothers of young children (Greenberg et al. 1994; Wall et al. 1995). Wall and colleagues (1995), however, reported that a pediatrician-based program increased self-reported continued abstinence at 6 months after delivery among women who had stopped smoking during pregnancy.

Predictors of postpartum relapse may provide clues for developing smoking cessation programs. Some risk factors include having a partner who smokes, having friends who smoke, lack of confidence at midpregnancy regarding continued non-smoking, and concern about weight (McBride and Pirie 1990; McBride et al. 1992; Severson et al. 1995; Mullen et al. 1997).

Factors of Special Importance Among Women and to Smoking Cessation

Weight Control

Smoking is related to body mass index (BMI), with smokers having lower BMI than do nonsmokers; this finding holds among both women and men (Rásky et al. 1996). Women are more likely than men to express concern about gaining weight when quitting smoking; however, few studies have found a relationship between weight concerns and smoking cessation among either women or men. Similarly, actual weight gain during cessation does not appear to predict relapse (Gritz et al. 1990; Killen et al. 1990a; Gourlay et al. 1994). Behavioral weight control programs have limited success in controlling weight gain during cessation, and generally no differences exist between women and men (Hall et al. 1992; Pirie et al. 1992). Exercise programs for weight control appear to have some benefit among women but have not been tested among men (Marcus et al. 1999). Pharmacologic approaches to weight control accompanying cessation include nicotine gum and bupropion. Such approaches appear to be useful as long as the quitter continues to take the drug; however, studies have indicated no difference in weight gain between treatment and control groups after the drug is withdrawn (Fiore et al. 2000). Other pharmacologic agents are only beginning to be explored.

Some smokers are concerned about gaining weight if they stop smoking. This concern is particularly common among women who smoke. In a survey of college students, Klesges and Klesges (1988) found that 39 percent of female students and 25 percent of male students reported that smoking was a dieting strategy. Among those who had attempted to stop smoking, 20 percent of female students and 7 percent of male students cited weight gain as the reason for relapse. Similarly, in a survey of young adults, Pirie and colleagues (1991) found the item "If I quit smoking, I would probably gain a lot of weight" to be endorsed by significantly more women who smoked (57.9 percent) than men who smoked (26.3 percent). Among current smokers who had attempted to stop smoking, weight gain was cited as a withdrawal symptom by 26.1 percent of women and 14.5 percent of men; among former smokers, it was cited by 29.5 percent of women and 19.2 percent of men.

In a prospective study of smokers identified in worksites, however, the belief that one would gain weight after smoking cessation was not related to participation in the cessation program (Klesges et al. 1988). Similarly, Jeffery and colleagues (1997) found no relationship between weight concerns and serious attempts to quit smoking. McGovern and colleagues (1994) found that women who participated in a cessation program weighed less than their smoking counterparts in the general population, which perhaps indicated that participants had less concern about weight. No difference in weight was observed between men smokers who participated in the program and those in the general population.

Smokers who are concerned about weight gain are thought to be less successful in smoking cessation treatment; this theory has been the focus of much research. Despite cross-sectional survey results indicating that weight gain is frequently cited as a reason for relapse (Klesges and Klesges 1988), prospective studies have had mixed results. In a study of 417 women, French and coworkers (1992) found that concern about weight was unrelated to successful smoking cessation. In a prospective study conducted at a worksite, dieting behaviors at baseline were found, in univariate analysis, to be unrelated to smoking cessation at the two-year follow-up; multivariate analyses showed that women smokers who had previously participated in weight loss programs, and who therefore were thought to be more concerned about weight, were more rather than less likely to stop smoking during the two years of follow-up (French et al. 1995). In a study of registered nurses in a smoking cessation program based at worksites (Gritz et al. 1990), neither weight gain during a previous cessation attempt nor fear of gaining weight as a deterrent in the past differentiated nurses who were abstinent at all follow-up points from nurses who were not continuously abstinent or from those who never stopped smoking. In a cohort of women and men smokers, Jeffery and colleagues (1997) found no relationship between weight concerns and smoking cessation. Furthermore, no differences were noted between women and men in concerns about weight or BMI and smoking outcomes. Gourlay and colleagues (1994) found a higher percentage of cessation at 26 weeks among

those more concerned about weight gain at baseline. On the other hand, Klesges and colleagues (1988) reported that those who stopped smoking were less likely at baseline to believe that they would gain weight after cessation than were those who did not stop. Streater and colleagues (1989) found that persons successful in maintaining abstinence from smoking during a 12-week study had lower levels of concern about weight gain before the study than did study participants who relapsed during the trial, but this difference was not significant. In another study, women in a smoking cessation intervention who reported at baseline that they would resume smoking if they gained weight were more likely to have relapsed at all follow-up points (Meyers et al. 1997).

Actual weight gain during initial periods of abstinence from smoking has not been shown to be a predictor of relapse in prospective studies. Killen and colleagues (1990a), in a study of 630 women and 588 men, found no relationship overall between early weight gain and abstinence at the six-month follow-up. Hall and colleagues (1986), however, in a study of 133 women smokers and 122 men smokers, found that persons who gained more weight in the initial stages of abstinence were more likely to remain abstinent at longer term follow-ups than were those who gained less weight. A similar finding was reported by Gourlay and colleagues (1994) in a study of 823 women smokers and 658 men smokers. None of those studies found a gender difference in weight gain and abstinence. Persons who continue to abstain may abandon their concern about weight in favor of the "higher good" of cessation (Hall et al. 1986; Gritz et al. 1990). Nevertheless, the concern about weight gain has led researchers to devise strategies to control weight gain after smoking cessation, hypothesizing that these strategies will result in better smoking cessation outcomes.

Behavioral Weight Management Programs

Two small intervention studies that combined behavioral weight control and smoking cessation interventions (Grinstead 1981; Mermelstein 1987) have been summarized in a previous report (USDHHS 1990). Neither of those programs succeeded in affecting smoking cessation, although one of them (Mermelstein 1987) succeeded in reducing weight gain after smoking cessation.

More recently, two large clinical trials tested the use of behavioral weight management programs as an adjunct to standard smoking cessation programs. Hall and colleagues (1992) reported on a trial that

randomly assigned 131 female smokers and 49 male smokers to one of three groups: (1) an innovative intervention that combined a smoking cessation program with daily monitoring of weight and contingent caloric reduction, an individual exercise plan, and behavioral self-management principles; (2) a nonspecific weight control program oriented toward providing insight into eating styles through discussion groups, nutrition and exercise information, group support, and therapeutic attention; and (3) a standard treatment program consisting of an information packet on good nutrition and exercise. All three groups received a smoking cessation program that combined aversive smoking and relapse prevention skills training in seven sessions. Contrary to the hypothesis, the group receiving only the information packet had significantly better smoking cessation outcomes than did either of the active weight control groups. Validated seven-day abstinence rates were 35 percent in the standard treatment group, 22 percent in the nonspecific treatment group, and 21 percent in the innovative treatment group. At 52 weeks, participants who stopped smoking had gained 3.61, 3.35, and 0.86 kg, respectively. No differences were found by gender. The authors offered two possible explanations for their findings: either the complexity of weight control interventions detracted from simultaneous efforts to stop smoking, or the caloric reduction prescribed in the active weight treatment programs actually encouraged smoking. The second explanation is consistent with the literature on animal studies and the reinforcing value of psychoactive drugs under conditions of caloric deprivation (Perkins 1994).

In the largest trial to date using random assignment (Pirie et al. 1992), 417 women smokers were assigned to (1) a standard smoking cessation program (*Freedom From Smoking® for You and Your Family*, an American Lung Association program), (2) the standard program plus nicotine gum, (3) the standard program plus a behavioral weight management program, or (4) the standard program plus both nicotine gum and the behavioral weight management program. Both nicotine gum and the weight management program were hypothesized to have effects on controlling weight. The standard program plus nicotine gum produced significantly better smoking cessation outcomes (both point prevalence and continuous abstinence at one-year follow-up) than did the standard program alone. The standard program plus the weight management program did not produce better smoking cessation outcomes than did the standard program alone. When both weight management and

nicotine gum were added to the standard program, the combination produced significantly poorer outcomes than did the standard treatment plus nicotine gum. Contrary to the hypothesis, no difference was noted in weight gain across treatments among persons who had abstained from smoking continuously for 12 months. The reasons for the lack of effectiveness of the weight control components are unclear. Compliance with aspects of the weight control programs, such as keeping food records, fell to low levels by the end of the intervention.

Exercise Programs

Exercise programs have been proposed as possible adjuncts to smoking cessation programs, in part because of their effects on weight control (Russell et al. 1988). A large observational study of U.S. nurses found that smoking cessation was associated with weight gain but that this relationship was diminished by spontaneous exercise, with a dose-response effect (Kawachi et al. 1996). Because calorie reduction may enhance the reinforcing value of smoking, exercise programs may be more successful than programs that focus on control of eating. Several reports have described exercise interventions in groups of women, but all these studies were small and short term. Russell and colleagues (1988) found no effect of the exercise intervention on either smoking cessation or weight outcomes in a study of 42 women randomly assigned to three treatment groups (exercise, general support, and a brief-contact control group).

Marcus and colleagues (1991) described an exercise intervention in a study of 20 women randomly assigned to one of two programs: 10 received a smoking cessation program only, and 10 received the smoking cessation program plus a supervised exercise program. At the end of treatment (4 weeks after smoking cessation), five of the exercise participants and none of the other participants were abstinent from smoking; the difference was significant. A second study controlled for the extra time exercise participants spent with counselors by having the non-exercise group spend an equal amount of time with health educators (Marcus et al. 1995). Twenty women were randomized to each of the two groups, but neither weight change nor smoking cessation was significantly different between groups. However, the exercise group had slightly higher rates of abstinence and lost a small amount of weight. A larger study (Marcus et al. 1999) randomly assigned 281 women smokers to a cognitive-behavioral program with exercise or the same program without exercise, but with equal

contact time with staff. Compared with smokers in the control group, those in the exercise arm of the study had higher smoking cessation rates immediately after the program (19.4 vs. 10.2 percent; $p = 0.03$), at 3 months after the program (16.4 vs. 8.2 percent; $p = 0.03$), and at 12 months (11.9 vs. 5.4 percent; $p = 0.05$). Furthermore, the exercise group had gained less weight than the control group (3.1 vs. 5.4 kg; $p = 0.03$). To ascertain whether there are differential effects on weight gain among women compared with men, trials that include a weight management component should be conducted among women and men and results analyzed by gender.

Pharmacologic Approaches in Relation to Weight Control

Pharmacologic approaches hold some promise for controlling the weight gain that often accompanies smoking cessation. These approaches are less complex than behavioral weight management programs and can thus more easily be incorporated into smoking cessation programs.

Nicotine Replacement

Perhaps the most widely studied pharmacologic agent for weight control after smoking cessation is nicotine itself, which is generally thought to be the agent responsible for the effects of cigarette smoking on controlling weight. The effects of nicotine on smoking cessation and weight gain have been assessed through the use of various delivery systems: nicotine polacrilex gum, transdermal nicotine, nasal spray, and inhalers (see "Pharmacologic Adjuncts" earlier in this chapter).

Since the 1970s, the research literature has hinted that nicotine polacrilex gum may reduce the amount of weight gain after smoking cessation. In 1987, Fagerström (1987) reviewed the existing studies and noted that, in the five published studies that compared nicotine gum and placebo, the placebo users in each study gained slightly more weight or were slightly more likely to gain weight. In each of these studies, however, the effects were small and non-significant.

Research published since Fagerström's review has been divided on the issue of whether nicotine gum contributes to weight control after smoking cessation. In an observational analysis, Emont and Cummings (1987) found a significant inverse correlation between the dose of nicotine gum and weight gain among persons who smoked more than 26 cigarettes per day at baseline. In other observational analyses, long-term

users of nicotine gum had gained significantly less weight at the one-year follow-up than had nonusers (3.1 vs. 5.2 kg) (Hajek et al. 1988; Killen et al. 1990a), and similar observations were made at the six-month follow-up (1.1 vs. 1.8 kg). Trials of nicotine polacrilex in which participants were randomly assigned to a condition, however, have reported mixed findings with respect to weight gain. In at least two trials with long-term follow-up, persons randomly assigned to receive nicotine gum did not gain less weight than those not receiving the gum (Hall et al. 1986; Pirie et al. 1992). In another trial in which participants were randomly assigned to different recommended dosages of nicotine gum (Gross et al. 1995), no relationship between treatment group and weight gain was found at 12 weeks after smoking cessation, but a significant inverse relationship was observed between weight gain and level of cotinine (a measure of actual exposure to nicotine). Leischow and colleagues (1992) reported a significant inverse dose-response effect on weight change among women but not among men in a trial in which participants were randomly assigned to placebo, 2-mg gum, or 4-mg gum, but follow-up was very short (4 weeks).

Several randomized trials found that nicotine gum delays, rather than prevents, weight gain after smoking cessation. Gross and coworkers (1989) reported significant differences in weight gain at 10 weeks of abstinence among smokers randomly assigned to receive either nicotine gum or placebo. By 3 months of abstinence, however, when most participants had discontinued gum use, the difference in weight was no longer significant. Nides and colleagues (1994) found an inverse relationship between the number of pieces of nicotine gum used per day and the percentage of baseline weight gained through 4 and 12 months among both women and men who had maintained abstinence from smoking. Participants who stopped using nicotine gum gained more weight than those who continued to use the gum. Doherty and colleagues (1996) reported that nicotine gum suppressed weight gain linearly with increasing nicotine dose and that smokers who substituted a greater portion of their baseline cotinine level with nicotine replacement gained less weight.

Much less information is available about the effects of other methods of nicotine delivery on weight control. Several studies found no weight control effects of the transdermal nicotine patch (Tønnesen et al. 1991; Transdermal Nicotine Study Group 1991) or a nicotine inhaler (Tønnesen et al. 1993) among persons who successfully stopped smoking by these

methods. However, a study by Dale and associates (1998) of the nicotine patch reported that amount of weight gained was inversely related to the proportion of baseline cotinine level that was replaced by nicotine patches. However, the weight gain was delayed, not prevented. At the one-year follow-up, weight change was not associated with the total dose of transdermal nicotine used or the average proportion of cotinine replaced during treatment. Weight changes at one year were not associated with gender. In another study, weight gain was reduced among those who stopped smoking with the use of nicotine nasal spray (Sutherland et al. 1992), but no apparent lasting effect on weight was observed among those who discontinued the nasal spray. The explanation for these differences in effect on weight by nicotine delivered in various ways is unclear.

Other Pharmacologic Agents

Several other pharmacologic agents have been assessed for their effect on weight gain after smoking cessation. Pomerleau and colleagues (1991b) studied the effects of fluoxetine hydrochloride (Prozac), which had previously been observed to produce weight loss, possibly by reducing cravings for carbohydrate, in a group of participants who had stopped or stringently reduced smoking. Results were reported for 21 persons (14 women and 7 men); of these, 11 received placebo and 10 received the active drug (60 mg/day). Ten weeks after the smoking cessation date, significantly more weight gain was reported by the placebo group than by the fluoxetine hydrochloride group (3.3 vs. -0.6 kg). Gender effects were not reported.

Spring and colleagues (1991) compared *d*-fenfluramine, an appetite suppressant, and placebo in a double-blind trial among obese females who smoked. *d*-Fenfluramine is hypothesized to release serotonin and thereby improve mood and to reduce carbohydrate consumption and weight gain. Four weeks after the smoking cessation date, 50 percent of 16 participants who received *d*-fenfluramine and 33 percent of 15 participants who received placebo were abstinent from smoking, but this difference was not statistically significant. The *d*-fenfluramine group had lost an average of 0.82 kg, and the placebo group had gained an average of 1.59 kg, a significant difference. When only those who had stopped smoking were compared, the difference in weight change remained significant (-0.82 kg in the *d*-fenfluramine group vs. 1.31 kg in the placebo group) (Spring et al. 1992). The observed weight change was correlated with greater

increases in caloric intake in the placebo group than in the *d*-fenfluramine group, particularly in intake of carbohydrate-rich foods. After smoking cessation, *d*-fenfluramine appeared to help control appetite and weight gain, but it did not demonstrate an important effect on smoking cessation. In view of recent findings of serious medical complications resulting from use of this pharmacologic agent, the role of *d*-fenfluramine products in smoking cessation may be controversial (Connolly et al. 1997; Mark et al. 1997).

Klesges and colleagues (1990) studied the effects of phenylpropanolamine, an over-the-counter weight control product, on the weight gain associated with smoking cessation. The study population consisted of women smokers who were asked to stop smoking for two weeks. They were randomly assigned to receive phenylpropanolamine gum, placebo gum, or no gum. Weight gain at the end of two weeks was 0.04 kg in the phenylpropanolamine group, 0.72 kg in the placebo gum group, and 0.88 kg in the no gum group. Fifteen of the 16 women assigned to the phenylpropanolamine group succeeded in stopping, significantly more than in the group assigned to placebo gum (12 of 21) or the group assigned to no gum (14 of 20).

Studies have examined weight changes among smokers who took bupropion (150 to 300 mg/day), which is sold for smoking cessation under the trade name Zyban. In such studies, smokers who took bupropion gained less weight initially. When the drug was stopped, however, no significant differences existed in weight gain (Hurt et al. 1997; Jorenby et al. 1999).

Depression

Many studies have confirmed that smoking is perceived to reduce negative affect, reduce stress, enhance positive affect, and provide a means to distract attention from disturbing stimuli. Studies of antidepressant therapy in smoking cessation have shown that antidepressants may effect changes in brain chemistry that are beneficial for cessation, whether or not a smoker is depressed (Edwards et al. 1989; Hall et al. 1998; Prochazka et al. 1998). Few studies have addressed gender-specific differences. Some evidence has suggested that smokers who have depressive symptoms at the time of a cessation attempt or who have a prior history of depressive symptoms are more likely than those with no such symptoms to benefit from antidepressant therapy (Niaura et al. 1995; Hall et al. 1998). Behavioral interventions for smokers with mood disorders appear to

be more successful when social support is provided (Hall et al. 1996; Muñoz et al. 1997; Hall et al. 1998).

Pathways Linking Depression and Smoking

Overrepresentation of persons with major depressive disorder (MDD) among patients of smoking cessation clinics has been noted (see "Depression and Other Psychiatric Disorders" in Chapter 3). Lifetime rates of MDD in cessation studies conducted at the University of California, San Francisco, have been reported at 46 percent (Ginsberg et al. 1995), 31 percent (Hall et al. 1994), and 22 percent (Hall et al. 1996). In all three of the university samples, women were more likely than men to report a history of depression.

Depression has complex relationships with other behaviors. Cigarette smoking may serve many needs among persons who tend toward depression or who are currently depressed. Among those addicted to nicotine, smoking is reinforcing and produces quick and direct reinforcement intrinsically. Pharmacologically, smoking has a stimulating effect that may indirectly increase one's chance of receiving positive reinforcement for continuing to smoke (Hall et al. 1993).

Studies of the effects of nicotine on mood were summarized in the 1988 Surgeon General's report on nicotine addiction (USDHHS 1988). Depressive mood, anxiety, nervousness, restlessness, irritability, impatience, anger, aggression, fatigue, and drowsiness have all been reported after smoking cessation (Hughes and Hatsukami 1986). Most of these symptoms appear to peak at one to two weeks after smoking cessation and return to baseline after one month (USDHHS 1988).

Theoretically, nicotine replacement therapies for nicotine withdrawal should eliminate these negative affect states; however, not all nicotine withdrawal symptoms are relieved with nicotine replacement. Irritability appears to be the only symptom that is uniformly alleviated; anger, anxiety, and impatience are frequently relieved (Hughes et al. 1991). Less consistently relieved are depressive mood, restlessness, annoyance, and hostility (Hughes et al. 1991).

Antidepressant Interventions in Smoking Treatment

Most studies of antidepressant treatment in smoking cessation have either not addressed gender-specific differences or have found none. In a male-only study using an antidepressant (imipramine hydrochloride, 75 mg) in smoking cessation treatment, Jacobs and colleagues (1971) found no benefit; however, smokers were encouraged to stop smoking

within the first two weeks of treatment, before the usual onset of antidepressant efficacy. In a small trial, Edwards and associates (1989) found that patients who received three weeks of doxepin treatment (150 mg) were more likely to be abstinent at two months than were patients who received placebo. No gender-specific differences were reported.

Recent studies of antidepressants in smoking treatment have been motivated by the putative effect of nicotine on neurotransmitters and by the effect of antidepressants on these same neurotransmitters. Hall and colleagues (1998) described the effects of nortriptyline among smokers (110 women and 89 men) with or without a history of MDD. Nortriptyline dose began at 50 mg for all patients; attempts were made to adjust levels to the therapeutic range for MDD (50 to 150 ng/mL). Independent of depression history, the percentage of participants who remained abstinent from smoking was higher among those who received nortriptyline than among those who received placebo, and overall results did not differ significantly by gender. Post hoc analyses found that women with a history of MDD were less likely than women with no such history to be abstinent on follow-up, but this relationship was not found among men. A study by Prochazka and colleagues (1998) also reported that nortriptyline increased cessation among smokers not currently suffering from depression. Although women were included in the study, results were not reported by gender.

Several studies that used bupropion have been reported (Ferry et al. 1992; Ferris and Cooper 1993; Hurt et al. 1997; Jorenby et al. 1999). Although the mechanism of bupropion is unknown, one hypothesis suggested it is primarily noradrenergic (Ferris and Cooper 1993). The majority of the studies found significantly higher smoking cessation rates among those who used bupropion.

Behavioral Interventions Targeted to Smokers with Mood Disorders

Five clinical trials have used behavioral interventions to treat smokers with mood disorders. They either did not report gender-specific differences or did not find such differences.

In the first trial (Zelman et al. 1992), 126 smokers were randomly assigned to one of two psychosocial strategies for smoking cessation, either skills training or support, and one of two "nicotine exposure" categories, either 2-mg nicotine gum or rapid smoking, in which a puff is inhaled from a cigarette every six seconds over a predetermined time period (e.g., 15 or 30

minutes). No differences were found among the four treatment groups at the one-year follow-up. These investigators did not report gender-specific differences.

Hall and associates (1996) classified patients by the presence or absence of a history of MDD. Patients were randomly assigned to either placebo or 2-mg nicotine gum and to either the cognitive-behavioral mood management treatment or an expanded health education program equivalent in time and therapeutic contact. A history of depression was not found to be associated with differences in treatment outcomes. The studies by Hall's group examined the data for gender-specific differences and found none. This result may be because of the level of social support provided (see "Social Support" later in this chapter). Repeating the study, but comparing the 10-session cognitive-behavioral mood management intervention with a 5-session health education control, Hall and associates (1998) showed the cognitive-behavioral intervention to be superior to the control intervention among smokers with a history of depression—a finding consistent with earlier work (Hall et al. 1994).

Another recent study suggested that cognitive-behavioral intervention may have effects among smokers with a history of depression (Muñoz et al. 1997). A self-administered mood management program for smoking cessation was provided to Spanish-speaking Latinos. The intervention resulted in a higher abstinence rate (23 percent) than a smoking cessation guide alone (11 percent). Participants who had a history of MDD but who were not currently depressed reported an even higher abstinence rate in the self-administered mood management program (31 percent). Gender-specific differences were not reported.

The pattern of results noted across the published studies tentatively suggested that increased emotional support may be useful among smokers who want to stop smoking and who have a history of mood disorder or who enter treatment with mood that is poorer relative to other smokers.

Social Support

Both social support during smoking cessation treatment and social support derived from family and friends have been shown to improve cessation rates (Fiore et al. 2000). Whether gender differences exist in the role of social support on long-term smoking cessation remains inconclusive. Some smoking cessation studies reported a greater effect of social support among women (Fisher et al. 1991, 1993; Pirie et al.

1997), while others reported a greater effect among men (Murray et al. 1995). More studies are needed to examine the role of social support by gender and to determine whether it exerts an effect independent of other factors (e.g., depression and possible hormonal influences) thought to influence successful cessation among women.

Gender and Social Support

On average, women appear to be more responsive to social events in their environment and to be more skillful at developing a range of satisfying and supportive social relationships than are men. However, the substantial responsibility that social networks carry may also increase stress, which in turn may increase the likelihood of smoking and decrease the likelihood of cessation. Perhaps as a result of this susceptibility to social influence, women who live with a smoker are less likely to stop smoking than are men who live with a smoker (Gritz et al. 1996). Cessation efforts may also be compromised by gender-specific stereotypes that discourage women from acting assertively on their own behalf (Blechman 1981). On the other hand, findings have suggested that women are more likely than men to believe that prevention and treatment of substance abuse, including smoking, is effective (Kauffman et al. 1997).

The multiple obligations created by women's social roles also appear to influence smoking cessation. For example, stopping smoking for the sake of a child or newborn is less likely among mothers with many caretaking responsibilities than among mothers with fewer responsibilities (Graham 1992). In qualitative research interviews with women who had smoked throughout pregnancy, Graham (1976) found that continued smoking was frequently attributed to anticipated negative emotional side effects of smoking cessation and to the likely impacts of these side effects on husbands and children.

Several studies indicated that women tend to be more attuned to their social surroundings than are men (Belle 1987; Acitelli and Antonucci 1994). Women are more likely than men to rate highly the importance of social support in stopping smoking (Cormier et al. 1990; DiLorenzo et al. 1990; Gritz et al. 1996), are somewhat more likely to join smoking cessation groups (Shiffman 1982; Fiore et al. 1990; Yankelovich Partners 1998), give higher ratings to the importance of emotional support (e.g., listening, encouragement, and understanding) than to more concrete assistance to reduce stressors and other temptations to relapse, and when successful, are more likely to report having

received social support to stop smoking (Cormier et al. 1990; DiLorenzo et al. 1990).

Ratings of social support received from family and friends have been found to predict smoking cessation (Mermelstein et al. 1986; Morgan et al. 1988; Murray et al. 1995; Gritz et al. 1996). Coppotelli and Orleans (1985) studied women's reports of support from their spouses for stopping smoking. Questionnaires were completed an average of 6.4 days after smoking cessation. Supportive acts predicted continued cessation at six to eight weeks after smoking cessation. These acts included response to the woman's request for help, support while she was stopping, and tolerance for the woman's struggles with smoking cessation and with her edginess, mood swings, and anxiety. In another study, women attempting to stop smoking reported both expecting and receiving a higher ratio of positive-to-negative behaviors compared with women not attempting to stop (Cohen and Lichtenstein 1990). This ratio was also predictive of continuous abstinence at 12 months.

Several other relationships make social support important among women who attempt to stop smoking. Depression is related to greater likelihood of smoking and complicates cessation (Glassman et al. 1990) (see "Depression" earlier in this chapter and "Depression and Other Psychiatric Disorders" in Chapter 3). Depression is more prevalent among women than among men, and social support appears to be related to level of depression (McGrath et al. 1990). Women are more likely than men to report smoking to reduce negative affect and stress (Gritz et al. 1996; Secker-Walker et al. 1996; Ward et al. 1997). Women trying to stop smoking have rated emotional or empathic support as more beneficial than instrumental support (Fisher et al. 1993).

Despite the convergence of data that have suggested that social support should be useful in helping women to stop smoking, evaluations of the relationship have remained inconclusive. Murray and colleagues (1995) found that the presence of a support person in cessation attempts had a greater effect among men than among women. Others also reported greater benefits of support among men than among women (Pirie et al. 1997). Other studies, however, suggested that women may benefit from social support more than do men, at least in the short term. In a program that emphasized small-group discussion, buddy systems, and exchange of perceptions and experiences, 71 percent of women were abstinent at the end of the program; only 26 percent in a comparison group were abstinent at the end of a program

that emphasized self-management ($p < 0.02$). Among men in the same study, 47 and 43 percent, respectively, were abstinent at the end of the program (Fisher et al. 1991, 1993). Those findings replicated an earlier study that suggested that programs emphasizing social support might have a short-term advantage for women (Fisher and Bishop 1986). Unfortunately, the

greater cessation rate among women was not reflected in follow-up assessments. The fact that such striking changes do not persist over time may not necessarily mean that support is unimportant, but that, as with many important determinants of behavior, its influence is maintained only if it continues to be available (Fisher 1997).

Smoking Cessation in Specific Groups of Women and Girls

Adolescent Girls

A number of programs and materials for adolescent smoking cessation have been developed and implemented, but typically evaluation has been anecdotal or descriptive (USDHHS 1994). Evidence has indicated that the proportion of adolescent smokers who participate in smoking cessation programs is low, attrition is high, and few participants quit smoking (USDHHS 1994; Moolchan et al. 2000). Few of the studies have reported data by gender. At present, data are insufficient to draw strong conclusions about gender-specific differences in smoking cessation interventions for adolescents. Overall, the findings suggested that adolescent girls might be more responsive than boys to social support, such as family or peer encouragement. Because regular smoking typically begins in the teenage years, effective smoking cessation messages and methods for adolescent girls who smoke are greatly needed, as are smoking prevention programs targeted to young nonsmokers.

School-Based Smoking Cessation Programs

School-based smoking cessation programs have been evaluated in several studies, with varying degrees of rigor and success. In an early study, St. Pierre and colleagues (1983) trained peer leaders to conduct a six-session program for high school students. The program content reflected standard cognitive-behavioral methods used in adult programs. Intensive recruitment yielded only six girls and six boys (smokers of 6 to 30 cigarettes per day) who completed the program. At the end of the program, none of the participants had stopped smoking, and the five girls for whom data were available tended to reduce their smoking less than the boys did.

The largest and most systematic school-based smoking cessation study (Sussman et al. 1995, 1998a,b) involved rural and suburban high schools in two states. Within each of the 16 schools in the study, students who volunteered to participate in a smoking cessation clinic were randomly assigned to a clinic group or to a wait-list control group. No gender-specific data were reported for cessation outcomes; the percentage who stopped smoking was very low for the total sample.

Participants were asked about 22 possible reasons for wanting to quit smoking. Only four significant gender-specific differences were found (Sussman et al. 1998a). These reasons were "if my girlfriend/boyfriend asked me to quit" (51 percent of girls vs. 57 percent of boys), "if someone close to me died because of smoking" (42 percent of girls vs. 49 percent of boys), "to look calmer" (14 percent of girls vs. 9 percent of boys), and "to have more endurance" (22 percent of girls vs. 18 percent of boys). Among girls, the four most frequently endorsed reasons for stopping were that a boyfriend asked (51 percent), a significant other had died (42 percent), the girl had a desire to live longer (42 percent), and a physician told her to stop (40 percent).

No gender-specific differences were found in the self-reported stage of readiness to stop smoking or in answers to the questions, "Do you think you will ever quit smoking?" and "Would you be able to quit on your own?" (Sussman et al. 1998a). Girls were more likely than boys to report being tempted to smoke in 9 out of 16 hypothetical circumstances, including circumstances indicating nicotine dependence, and girls were less likely than boys to answer yes to the question, "Have you really tried to quit smoking before?" (65 vs. 59 percent; $p < 0.03$). Boys were more likely

than girls to report that they might participate in a cessation program at school.

Another study by Sussman and colleagues (1998b) assessed self-initiated smoking cessation among adolescents. In the follow-up of a large sample of adolescents in alternative schools, gender did not predict cessation. Similarly, Hu and colleagues (1998) did not find gender to be a predictor of cessation. In an assessment of predictors of smoking cessation among adolescents in New Hampshire high schools, Sargent and colleagues (1998) found a weak association between gender and cessation, with boys more likely to stop smoking than were girls (adjusted RR, 1.3; 95 percent CI, 0.7 to 2.5). When all the predictive factors were entered into a logistic regression, gender no longer was predictive.

A few studies evaluated smoking cessation strategies for adolescents in vocational high schools, settings likely to have a high proportion of smokers (Pallonen et al. 1994, 1998; Smith et al. 1994). The interventions were delivered by computer and featured the expert system adapted from a program used with adult smokers (Velicer et al. 1993). The expert system elicited relevant information from the student (e.g., smoking history and interest in smoking cessation) and delivered feedback and suggestions tailored to this information. Data from 10th- and 11th-grade vocational students indicated that girls rated the computerized intervention program significantly more positively than did boys (Smith et al. 1994). No gender-specific data were reported for cessation.

Balch (1998) conducted focus groups with high school smokers in three states and observed that girls expressed more interest in participating in group programs than did boys. The authors interpreted this observation as a reflection of girls' greater concern about the opinions of others.

Other Smoking Cessation Programs

Biglan and colleagues (summarized in Hollis et al. 1994) used an HMO to identify youth smokers. Adolescents who met the eligibility criteria were randomly assigned to a smoking cessation intervention or to a control group that received no treatment. The focus of the intervention was a 60-minute consultation with a nurse practitioner at a convenient HMO clinic. Incentives were offered for attending these sessions. A lottery with the chance to win \$100 was established, and abstinence from smoking was required to win. There was no effect of the intervention overall, and differences by gender were not reported.

Adolescents who received treatment for substance abuse have high smoking rates, and the treatment setting provides an opportunity for smoking intervention (Myers 1999). In a small study, 6 of 35 adolescents were abstinent at the three-month post-intervention follow-up. Gender was not a predictor of response to treatment.

Weissman and colleagues (1987) recruited 11 "hard core" smokers (5 girls and 6 boys) aged 13 through 18 years who were attending an alternative school. The participants were selected from smokers who auditioned for parts in a smoking prevention videotape or who were identified by those who auditioned. Their average age was 15.6 years, they had smoked for an average of 2.5 years, and they smoked an average of 18 cigarettes per day. Monetary rewards were based on achieving target levels of carbon monoxide in expired air samples. Five of the six boys successfully reduced smoking and carbon monoxide levels each month during the reduction and cessation phases. Unannounced probes for four months after the cessation date indicated continued abstinence by two boys, sporadic smoking by two, and low-level daily smoking by one. In contrast, all five girls dropped out during the program and continued smoking.

Hurt and colleagues (2000) tested the efficacy of the nicotine patch in 101 adolescent smokers, of whom 41 percent were female. The nonrandomized trial drew volunteers whose median smoking was 20 cigarettes per day (range, 10 to 40). At the end of therapy (6 weeks), 10.9 percent of participants were abstinent, as verified by expired carbon monoxide and plasma cotinine. At six months, however, only 5.0 percent were abstinent, a rate that appears lower than the secular trend for cessation among adolescents (Sussman et al. 1995, 1998b). Gender differences were not reported.

Women Who Smoke Heavily

Among persons who smoke heavily, women are more likely than men to join smoking cessation programs (Cohen et al. 1989; Wagner et al. 1990; Orleans et al. 1991b; Thompson et al. 1998). In cessation studies, a number of researchers have found that women who smoke heavily are less likely to achieve long-term cessation than are men (Bjornson et al. 1995; Nides et al. 1995), but others have found no difference in quitting between women and men who smoke heavily (Goldberg et al. 1993; Fortmann and Killen 1995).

Characteristics Related to Heavy Smoking

Persons who smoke heavily account for a disproportionately high share of mortality related to smoking (USDHHS 1984). To ensure that the classification of heavy smokers does not include moderate smokers who round up their daily smoking to 20 cigarettes (1 pack) per day, 25 cigarettes per day has been adopted by many researchers as the point at which smokers are considered heavy smokers (Sorensen et al. 1992b; COMMIT Research Group 1995a,b); however, some researchers have used 20 or more cigarettes per day as a definition of heavy smoking (Glassman et al. 1988; Serxner et al. 1992; Thornton et al. 1994).

Research has suggested that those who smoke heavily display characteristics of nicotine addiction that distinguish them from lighter smokers (USDHHS 1988). Using the Fagerström Tolerance Questionnaire, investigators have demonstrated that heavy smokers are more dependent on nicotine than are light or moderate smokers. Heavy smokers also have internal cues that trigger smoking, have more difficulty stopping, and have more withdrawal symptoms (e.g., anxiety and fatigue) during smoking cessation (Killen et al. 1988; Goldberg et al. 1993). Among heavy smokers, females are more likely than males to report feeling dependent on cigarettes and feeling unable to cut down (CDC 1995a), to have lower expectations of stopping in the near future, to report their last attempt to stop as difficult, to want assistance in stopping, and to be more concerned with weight gain (Sorensen et al. 1992b). Women who are heavy smokers may be more likely than men who are heavy smokers to view a reduction in the amount smoked as preferable to smoking cessation (Blake et al. 1989).

Although heavy smoking is inversely related to smoking cessation (Cohen et al. 1989; Wagner et al. 1990; Orleans et al. 1991b; Kozlowski et al. 1994), heavy smokers are more likely than light or moderate smokers to join smoking cessation activities (Cohen et al. 1989; Wagner et al. 1990; Orleans et al. 1991b; O'Loughlin et al. 1997; Thompson et al. 1998). Wagner and colleagues (1990) used a large, defined population of 50,000 smokers in an HMO database to examine rates of participation in self-help activities for smoking cessation. Comparing a 10-percent random sample of smokers drawn 10 months before the project began with smokers who volunteered to participate in the project, they found that heavy smokers were more likely to participate than were lighter smokers (RR, 2.8; 95 percent CI, 1.9 to 3.8). Moreover, women were significantly more likely than men (63 vs. 48 percent) to participate. Women were especially

more likely than men to participate if they had symptoms related to smoking (e.g., a cough or shortness of breath) (RR, 5.6; 95 percent CI, 3.01 to 10.4). The authors did not report the proportions who stopped smoking. Sorensen and colleagues (1992b) also found that among women, those who smoked heavily were significantly more likely than light or moderate smokers (64 vs. 47 percent) to state that they wanted assistance to stop smoking.

Unassisted Smoking Cessation Among Women Who Smoke Heavily

Little is known about the natural history of smoking cessation among women who are heavy smokers or about the gender-specific differences in smoking cessation among heavy smokers. The COMMIT study followed cohorts of heavy smokers and light or moderate smokers for five years (COMMIT Research Group, unpublished data). The cohorts in the comparison communities provided data on unassisted smoking cessation among both women and men who smoked heavily. More than one-half of the women (55.6 percent) and men (53.9 percent) who smoked heavily reported decreasing the number of cigarettes they smoked per day during the five years of the study. Men reported slightly more attempts to stop smoking for at least 24 hours (2.9) than did women (2.2). Among persons who sustained cessation for six months or more at the end of the five years, cessation was slightly higher among men than women who smoked heavily (19.6 vs. 17.2 percent). Among heavy smokers, the RR for smoking cessation was 0.6 (95 percent CI, 0.4 to 0.9) among women compared with men after adjustment for age, ethnicity, and education.

Cessation Programs for Women Who Smoke Heavily

As part of a smoking cessation intervention delivered by physicians, women and men who smoked heavily were compared with women and men who were lighter smokers (Goldberg et al. 1993). Among women at baseline, heavy smokers had higher levels of addiction than did lighter smokers. They had also smoked longer, had made fewer attempts to stop smoking, were less confident of their ability to stop smoking, had higher perceptions that others wanted them to stop smoking, and had previous physical symptoms related to smoking (e.g., lung disease and asthma). Interventions consisted of physician advice, counseling specific to the patient, and counseling plus nicotine gum. At the end of six months, continuous

cessation for one week was achieved by 10 percent of women who were heavy smokers and 15 percent of women who were light smokers. Among heavy smokers, a comparable percentage of women (10 percent) and men (11 percent) stopped smoking.

The Lung Health Study, an ongoing randomized study of more than 3,900 smokers, examined long-term cessation at 12 and 36 months (Bjornson et al. 1995). Participants received intervention consisting of a message from a physician, a 12-week behavioral change program, nicotine gum, and a maintenance program; 91 percent of participants attended at least one class of the cessation program. For analysis, participants were classified as heavy smokers (≥ 30 cigarettes per day) or lighter smokers (<30 cigarettes per day). Cessation among women who were heavy smokers was 21 percent at 12 months and 14 percent at 36 months; among men, the quit rate was 28 percent at 12 months and 22 percent at 36 months.

The Lung Health Study also reported that women initially found it more difficult than men to stop smoking. Smoking cessation history, such as previous long-term cessation (6 months), identification of any cigarette other than the first cigarette of the day as being the most difficult to give up, better long-term health (e.g., no asthma or breathlessness), and support for stopping were all predictive of initial cessation. Both women and men were more likely to have an early relapse (within 4 to 12 months) if they reported smoking at all since the cessation day. No other factor was predictive of early relapse among women. Predictors of late relapse (at 12 to 24 months) among women included nicotine gum use at 12 months and having other smokers in the house at 12 months. Predictors for early relapse among men were any smoking since the cessation day and use of nicotine gum at 4 months; men were less likely to relapse if they had a support person at the orientation and lower dependence on nicotine at baseline (Nides et al. 1995). The study also found that women with higher dependence on nicotine, as assessed by smoking when emotionally triggered, feeling deprived when not smoking, being physiologically dependent, and waiting a low number of minutes to the first cigarette of the day, found it harder to stop smoking than did men with similar ratings of nicotine dependence (Bjornson et al. 1995).

In contrast to the Lung Health Study, in a study of 1,044 persons who used nicotine gum for cessation, data were stratified by both gender and amount smoked. This study found no difference in cessation between heavy and light smokers or between women

and men (Fortmann and Killen 1995). The researchers also found that persons who smoked heavily were more likely to relapse, but found no gender-specific differences.

Women of Low Socioeconomic Status

Smoking prevalence is inversely related to SES, regardless of the indicator(s) used and regardless of gender (see Chapter 2). Similarly, women of low SES have lower rates of smoking cessation than do women of higher SES. On a population level, the less educated and those living below poverty level have been reported to be less likely to achieve smoking cessation (Novotny et al. 1988), a finding confirmed by others (Fiore et al. 1990; Hatziafreu et al. 1990; Winkleby et al. 1992). Mass-media attempts to reach women smokers of low SES have had some effect, with women more likely than men to watch televised programs and read materials; however, the cessation rates among women tend to be lower than those among men except in the long term (24 months) (Warnecke et al. 1992). A number of studies have examined quit rates among pregnant women of low SES. Spontaneous cessation rates appear to be lower than those among pregnant women of higher SES (Cnattingius et al. 1992; O'Campo et al. 1992). Cessation programs directed at pregnant women of low SES appear to increase quit rates over control programs that provide usual care such as distribution of brochures and lists of local cessation programs; quit rates appear to be directly related to the intensity of the intervention (Windsor et al. 1993b; Albrecht et al. 1994; Lillington et al. 1995). The effect of worksite programs for low-SES women smokers is a new area of exploration, but at least one study suggested that worksites may be good venues for reaching these women (Gritz et al. 1998).

Measures of Low Socioeconomic Status

SES is assessed in many ways, most often by using measures of income, education, or occupation. The three factors are strongly correlated, and each has been used separately as a proxy for SES. Income is a good indicator of overall SES, and studies have defined female smokers with low income as those living below the poverty level (Novotny et al. 1988), living below a specified income (Warnecke et al. 1991; Manfredi et al. 1992; Kendrick et al. 1995), or eligible for public housing (Manfredi et al. 1992) or other public services (Albrecht et al. 1994; Brayden and Christensen 1994; Keintz et al. 1994; Rafuse 1994; Lillington et al. 1995). Years of education is the most commonly

reported measure of SES (Macaskill et al. 1992; Winkleby et al. 1992; Windsor et al. 1993b; Albrecht et al. 1994; Kendrick et al. 1995), and it appears to be the measure most strongly related to smoking cessation (Pierce et al. 1989; Hatziaandreu et al. 1990). Occupational status is also used as an indicator of SES, with blue-collar occupations indicating lower SES than do white-collar occupations (USDHHS 1985; Jeffery et al. 1993; Gritz et al. 1998).

Cessation Programs in Public Health Settings

Smoking cessation programs for low-income women have been instituted in public health clinics and community health centers. Recognizing that women of low SES have severe economic problems that may result in significant stress and that may be partially relieved by smoking, some cessation programs have included a wide range of topics that address stress management, self-esteem, group support, and general activities that improve quality of life (Rafuse 1994). This intensive intervention resulted in a 20- to 25-percent cessation rate. Other efforts have encouraged women of low SES to participate in group classes on smoking cessation and in counseling with a physician (Macken et al. 1991) or in clinic-reinforced, self-help cessation activities (Keintz et al. 1994). Unfortunately, only a small proportion of women of low SES appear to take advantage of these programs. A clinic serving a primarily female, low-income, urban population found that 24 percent of women who smoked were interested in a smoking cessation class with a physician, but only 36 percent of those interested (8.6 percent of all the women who smoked) actually kept their appointments (Macken et al. 1991). Another study in a community primary care health clinic found that half of 55 women smokers surveyed indicated on an initial questionnaire that they would be willing to participate in a smoking cessation program (Pohl et al. 1998). However, only 20 percent of the original group showed up for the first class.

Manfredi and colleagues (1998) identified and surveyed low-income women about a number of issues they thought might be related to motivation to stop smoking. Of all the potential predictors studied, only health effects, not wanting to be addicted, and the expense of cigarettes were related to wanting to stop.

Keintz and colleagues (1994) performed follow-up on more than 1,200 women in a public health setting in which the women smokers received advice and a self-help guide on cessation. In a retrospective survey administered before the intervention, a random sample of 3,260 women attending the clinics was

drawn. Of the survey participants, 5.2 percent of clients who smoked at the beginning of the prior 12-month period were estimated as having been abstinent from smoking for 90 or more days during those 12 months. After one year of exposure to the intervention program, 9.1 percent of women smokers in the clinics had stopped smoking for at least 90 days, a statistically significant difference. An examination of the characteristics of women successful in achieving cessation included those who were lighter smokers (<25 cigarettes per day), were more educated (high school or more), were less addicted (smoked the first cigarette >30 minutes after awaking), and were more confident in their ability to stop smoking. Logistic regression analyses identified three factors related to cessation: confidence in ability to stop smoking, the interaction of lower addiction (Fagerström score) and age, and the interaction of addiction and education—which was the strongest of the multivariate factors.

A Canadian smoking cessation program targeting low-income women was available through local community groups and was delivered free of charge by trained facilitators (O'Loughlin et al. 1997). The materials and content were developed to be specifically relevant to low-income women. Although the cessation program was targeted to women and attracted mostly women (n = 83, 73.5 percent), men (n = 30, 26.5 percent) were also allowed to participate. Despite being targeted to women, cessation rates were higher among men (40.0 percent at 1 month, 26.1 percent at 6 months) than among women (28.2 percent at 1 month, 21.1 percent at 6 months). The statistical significance of these findings was not reported.

Effects of Mass Media

Studies of the mass media suggested that smokers of low SES, especially women, are more likely than smokers of higher SES to seek information from visual sources, especially television, and that such campaigns can be targeted to specific groups. For example, a seven-month media campaign in San Francisco, California, which was designed to change people's level of information, showed that a culturally appropriate, multichannel campaign can improve community knowledge (Marín et al. 1990a).

In a large, televised cessation intervention in the Chicago, Illinois, area, Warnecke and colleagues (1991) found that, overall, women were more likely than men to watch televised smoking cessation programs, attend group sessions, and refer daily to the self-help cessation manual. A multiple regression model of participation in the program showed that gender and income were the only significant variables

in predicting whether televised segments would be watched. Women, African Americans, and persons with low income were the most likely to watch the televised segments. Overall, women with low income (<\$13,000 per year) were more likely than men with low income to view and recall the televised segments. Gender and education were significant in predicting the frequency with which smokers referred to the self-help manual and the level of recall of the manual. Among those with more than a high school education, women were more likely than men to refer to the manual daily and to recall parts of the manual. Regardless of SES, women smokers were more responsive than men smokers to the media. Cessation rates were high in the intervention group at 12 months after treatment (14 vs. 6 percent) and at 24 months (6 vs. 2 percent). Significantly more men than women had quit at all follow-up points, except at 24 months (Warnecke et al. 1992).

As part of the Chicago televised project, women with very low income (median, \$5,000 per year) who lived in subsidized public housing were asked about their smoking behavior six months before the intervention for smoking cessation began (Manfredi et al. 1992). Compared with the general population of smokers who were not residents of public housing, the women residents had a lower desire to stop smoking, reported fewer previous attempts to stop, perceived fewer risks from smoking, had more smokers among their friends, and were less knowledgeable about where to receive information about or assistance with smoking cessation. As in other studies of low-income populations (Rafuse 1994), respondents in eight focus groups reported they had highly stressful lives that they perceived as partially assuaged by smoking (Lacey et al. 1993). Women also reported little social support for stopping, saw smoking as a pleasure, saw few risks from smoking, reported that "everyone" in their environment smoked, had no information about how to stop smoking, and perceived that enough willpower would lead to cessation.

A large mass-media campaign in Sydney and Melbourne, Australia, also concluded that television was a good way to present antismoking messages to smokers of low SES (Macaskill et al. 1992). The researchers assessed smoking prevalence during the first year of the campaign and five years after it, and they used the rate ratio (prevalence after intervention relative to prevalence before intervention) adjusted for age. Among women in Sydney and among men in both Sydney and Melbourne, the rate ratio by educational level was consistently lower after than before the intervention, and no linear trend with increasing

education was apparent. Among women in Melbourne, those with some university education had a lower rate ratio than did women with less education.

Cessation Programs for Pregnant Women of Low Socioeconomic Status

A few studies have examined natural smoking cessation patterns among pregnant women of low SES. In a prospective study of approximately 1,900 pregnant women who were smokers just before becoming pregnant or during pregnancy or who had relapsed after giving birth, 41 percent who had smoked before pregnancy stopped during pregnancy (O'Campo et al. 1992). Cessation rates during pregnancy increased substantially with level of education among white women: 13 percent of those with less than 12 years of education but 67 percent of those with more than 12 years of education stopped smoking. Among African American women, 35 percent of those with less than 12 years of education but 49 percent of those with more than 12 years of education stopped. Logistic regression, adjusted for the effects of education, age, parity, marital status, and intention to breastfeed an infant, indicated that white women who had stopped smoking were more likely to be younger than 25 years of age (RR, 3.4; 90 percent CI, 1.3 to 9.0), to have more than 12 years of education (RR, 21.8; 90 percent CI, 5.1 to 92.5), to have no other children (RR, 2.9; 90 percent CI, 1.3 to 9.0), to be married (RR, 2.3; 90 percent CI, 0.8 to 6.3), and to intend to breastfeed (RR, 1.2; 90 percent CI, 0.5 to 2.9). Among African American women, only intent to breastfeed was significantly associated with smoking cessation during pregnancy (RR, 2.7; 90 percent CI, 1.2 to 6.0). A similar study in Sweden that examined all women users of prenatal care clinics in one county (3,678 participants) found that pregnant women with low education were less likely to stop smoking during pregnancy (RR, 1.2 for 9 years of education; 90 percent CI, 1.0 to 1.5) (RR, 0.7 for 12 years of education; 95 percent CI, 0.5 to 0.9) (Cnattingius et al. 1992). Furthermore, spontaneous smoking cessation during pregnancy appears to be lower among women of low SES than among women of higher SES. Two studies that involved pregnant women of higher SES showed that 41 percent had stopped smoking spontaneously (Messimer et al. 1989; Mullen et al. 1990); an earlier study showed that 22 percent of pregnant women of low SES had stopped smoking spontaneously (Windsor et al. 1985).

A review of five randomized, controlled trials on smoking cessation conducted between 1983 and 1993

with a total of 4,277 low-income pregnant women indicated that low-level, minimal contact interventions had some effect in this population. Cessation rates ranged from 3 to 18 percent (Albrecht et al. 1994). The most intensive interventions had much better results (quit rates of 11 to 18 percent) than did low-intensity interventions. In one study, for example, 11 percent of women who received one-to-one counseling and instructions in behavioral change had stopped smoking, whereas only 3 percent of women in the control group did so (Albrecht et al. 1994). A Los Angeles, California, study of low-income pregnant women in four WIC sites (155 intervention women and 400 control women) found that 43 percent of women in the intervention group but 25 percent of women in the control group achieved cessation (Lillington et al. 1995). The proportion of women who maintained cessation after childbirth was 25.3 percent among the treated women and 11.6 percent among the control women.

An intensive intervention program that depended heavily on one-to-one counseling in a clinical setting achieved 30.8 percent smoking cessation among counseled low-income pregnant women; uncounseled control women achieved a 15.4-percent cessation rate (not confirmed by urine testing) (Brayden and Christensen 1994). A study that used only minimal intervention was conducted among low-income pregnant women at WIC sites in three states (Kendrick et al. 1995). Self-reported cessation was significantly higher among women in the intervention group than in the control group (13.0 vs. 9.0 percent). However, when cotinine level was used, the results differed for the subset of participants who provided urine samples for verification (51 vs. 68 percent) and no significant difference was found in cessation (6.1 vs. 5.9 percent). Windsor and colleagues (1993b) reported a study in which 814 low-income pregnant women were randomly assigned to a smoking cessation intervention that consisted of a short counseling session, self-help cessation materials, clinic reinforcement, and social support or to a control group. Cessation was 14.3 percent in the intervention group and 8.5 percent in the control group.

Cessation Activities in Occupational Settings for Women of Low Socioeconomic Status

Currently, women make up 37.7 percent of the workforce in manufacturing companies (Tom Nardone, U.S. Bureau of Labor Statistics, fax to Beti Thompson, November 4, 1997). Although it is not known precisely how many of those women hold

blue-collar occupations, a study of 114 manufacturing worksites identified 76.4 percent of their female employees as holding blue-collar jobs (Gritz et al. 1998). Smoking cessation activities in occupational settings attract more women than men in general, but participation by blue-collar workers, regardless of gender, is very low (Schilling et al. 1985; Sorensen et al. 1986; Jeffery et al. 1993). Cessation rates by gender have rarely been reported (Jeffery et al. 1993; Gritz et al. 1998). A recent trial that involved 114 worksites and more than 28,000 workers sought to increase rates of smoking cessation among the employees (Gritz et al. 1998). Comprehensive activities to foster smoking cessation took place in intervention worksites (Abrams et al. 1994a; Sorensen et al. 1996). Although the proportion of employees who stopped smoking was similar overall in the intervention worksites and control worksites, a significantly higher proportion of women in intervention worksites than in control worksites stopped for six months or longer (15.0 vs. 10.6 percent; $p = 0.03$) (Gritz et al. 1998). When age and occupational status (white collar vs. blue collar) were held constant, the RR for smoking cessation among women in the intervention group was greater than that among women in the comparison group (RR, 1.5; 95 percent CI, 1.01 to 2.2) in worksites where more than 75 percent of the women employees held blue-collar occupations.

Minority Women

To date, little research has been conducted to assess the effectiveness of various smoking cessation interventions among minority women in the United States (King et al. 1997; USDHHS 1998). Research among racial and ethnic groups, particularly behavioral research, is complex because accessing the target populations is difficult and because minority groups do not trust researchers (USDHHS 1998). In general, African American, Hispanic, and American Indian or Alaska Native women want to stop smoking at rates similar to those of non-Hispanic whites, and want to stop smoking more than do men in their racial or ethnic group. Mixed results have been observed in studies that have examined differences in quit rates between African American women and non-Hispanic white women. Overall, research has suggested that more African American men achieve cessation than do African American women (Royce et al. 1995; Fisher et al. 1998). Studies targeting pregnant African American and Hispanic women have been inconsistent, with some studies finding a difference between non-Hispanic whites and other racial and ethnic

groups (Gebauer et al. 1998) and other studies finding no difference (Windsor et al. 1985, 1993b; O'Campo et al. 1992).

African American Women

Data from the 1993 NHIS showed that 74.9 percent of African American women smokers would like to stop smoking (68.9 percent of African American men and 72.4 percent of white women who smoke would like to stop) (USDHHS 1998) (see also Chapter 2). Several studies have attempted to determine psychosocial and environmental factors that may identify an African American woman's degree of readiness to stop smoking, as well as the predictors of readiness, for use in developing cessation programs for this population.

Ahijevych and Wewers (1993) surveyed 187 African American women smokers aged 18 through 69 years in a metropolitan area in Columbus, Ohio, to describe determinants of smoking and smoking cessation. Cessation attempts had been made by 83 percent of these women: 22 percent of the women had tried five or more times to stop smoking, 21 percent three or four times, and 41 percent one or two times.

The Minnesota Heart Survey, a 1985–1986 cross-sectional study, described the smoking and cessation behaviors of urban African Americans and whites, aged 35 through 74 years, in Minneapolis-St. Paul, Minnesota (Hahn et al. 1990). Of the 593 African American women in the survey, 18 percent were former smokers and 33 percent were current smokers. No significant differences were found between the African American women and white women regarding intentions to change smoking behaviors in the next year. Crittenden and colleagues (1994) administered a questionnaire on readiness to quit to 495 women who smoked (55 percent African Americans, 42 percent non-Hispanic whites) at four public health clinics in the Chicago area. Race was not related to readiness to change.

Self-Help Attempts Among African American Women

Resnicow and colleagues (1997) tested a self-help smoking cessation program that included a printed guide, a videotape, and a booster telephone call to a cohort of 650 inner-city African Americans (377 women and 273 men) in Harlem, New York. No significant differences were observed between intervention and control groups. Further, results were not different by gender.

A targeted media campaign designed to motivate African Americans to call NCI's CIS line for smoking

cessation assistance randomly assigned 14 communities to intervention or control (Boyd et al. 1998). After a media campaign that lasted approximately one year (with time off between media spots), the volume of calls from African Americans was significantly higher in the intervention than control communities ($p < 0.008$). More calls came from African American women (55 percent) than from African American men (45 percent). Cessation rates were not reported.

Cessation Programs for Pregnant African American Women

Much of the research that has been reported on cessation programs for African American women has focused on pregnant women. Pregnancy is an opportune time in a woman's life for a smoking cessation program (see "Pregnancy" earlier in this chapter). Several approaches have been tested in prenatal smoking cessation programs for low-income African American women.

In a prospective interview survey in Baltimore, Maryland, of 1,900 pregnant women (52 percent African Americans, 48 percent whites), O'Campo and colleagues (1992) found that intention to breastfeed was the only predictor for smoking cessation during pregnancy among African American women, whereas among white women predictors included educational level, age, and parity (see "Women of Low Socioeconomic Status" earlier in this chapter). No significant difference was observed between African Americans and whites in cessation. Relapse to smoking after delivery was high: 46 percent of African American women and 28 percent of white women who had stopped smoking during pregnancy relapsed within 6 to 12 weeks after delivery. The best predictor of early relapse after delivery among African American and white mothers alike was formula feeding of the infant.

Byrd and Meade (1993) examined the effect of a brief-contact smoking cessation program among 57 pregnant women at two Milwaukee clinics, of whom 79 percent were African American. After receiving educational materials, study participants were randomly assigned to receive usual care (e.g., advice on smoking) provided by clinic physicians or to receive counseling from a nurse who used a systematic, tailored approach based on the protocol developed by NCI (the Four A's: Ask, Advise, Assist, Arrange). No statistically significant difference was noted in smoking status among those who received the usual care and those who received the nurse counseling intervention.

In another study that used NCI's Four A's protocol, nurses delivered the intervention to pregnant women in a primary care prenatal clinic (Gebauer et al. 1998). A control group was assessed one year before recruitment of the intervention group. The 84 women in the intervention arm (50 percent African Americans) received individualized counseling delivered by an advanced-practice nurse, combined with a telephone contact 7 to 10 days after the initial clinic visit. The three-month cotinine-validated abstinence rate was 15.5 percent among the intervention group and 0.0 percent among the control group, a statistically significant difference ($p < 0.001$). Among women abstinent at the follow-up visit, a significantly greater percentage were African American (84.6 percent) than white (15.4 percent).

Lillington and colleagues (1995) designed a culturally appropriate program for low-income African American women and Hispanic women who were pregnant or who had recently given birth. The study enrolled 768 women from four WIC clinics in south and central Los Angeles and obtained follow-up data for 555 women (155 in the intervention group, 400 in the control group). Of the 555 participants, 53 percent were African American and 43 percent were Hispanic; 41 percent were current smokers and 59 percent were former smokers. Women in the control group received usual care, printed information about the risks from smoking, and a group message on smoking cessation. Of the women who were smokers at baseline, 44 percent of those at the intervention clinics and 23 percent of those at the control clinics were abstinent at nine months' gestation ($p = 0.004$), and 27 percent of those at the intervention sites and 8.5 percent at the control sites were abstinent at six weeks after delivery ($p = 0.002$). Among African American women who were former smokers at baseline, significantly lower relapse rates were reported in the intervention group than in the control group at nine months' gestation and at six weeks after delivery. (See "Hispanic Women" later in this chapter for results for Hispanic women in the study.)

Windsor and colleagues (1985) compared the effectiveness of two self-help interventions with the standard smoking cessation information given to pregnant women at three public health maternity clinics in Birmingham, Alabama. Of the 309 study participants, 62 percent were African American. The women were randomly assigned to one of three groups (two intervention and one control). Cessation was determined by self-report at midpregnancy and at the end of pregnancy, with confirmation by testing

salivary thiocyanate. Six percent of women who received the first self-help intervention and 14 percent who received the second self-help intervention stopped smoking, whereas only 2 percent in the control group stopped smoking. Race was not a predictor of cessation.

In a later study, a three-component health education intervention for low-income pregnant women at four public health maternity clinics was compared with routine care and information on the risks from smoking (Windsor et al. 1993b). Of the 814 women in this study, 52 percent were African American. Only patients who reported having stopped smoking at their first and follow-up clinic visits and who had a cotinine level of 30 ng/mL or less were considered to have stopped smoking. Study results indicated that the multistep intervention was effective in changing smoking behavior. The proportions who stopped were similar among African American women and white women.

When the methods of the Birmingham trial (Windsor et al. 1993b) were replicated in a large prenatal clinic in Baltimore, Maryland, that served predominantly low-income, African American women, the intervention was not effective (Gielen et al. 1997). At their first prenatal visit, 391 smokers were randomly assigned to an intervention group to receive usual clinic information plus a prenatal and postpartum intervention or to a control group that received only usual clinic information. Almost 85 percent of the patients in both the intervention ($n = 193$) and control ($n = 198$) groups continued the preconception smoking pattern throughout pregnancy. Of the 13 women who had stopped smoking and who were followed up to six months after delivery, 85 percent relapsed.

Other Cessation Programs for African American Women

Royce and colleagues (1995) examined the usefulness of NCI's Four A's approach in smoking cessation counseling delivered by a health care clinician in conjunction with socioculturally appropriate self-help materials on smoking cessation and relapse prevention for low-income African Americans. At baseline, 153 African American smokers (96 women and 57 men) in a neighborhood clinic in Harlem (New York City, New York) were interviewed briefly as they waited for their clinic appointment. At the end of the interview, patients in the study received a copy of the project-designed KICKIT! guidebook, the KICKIT! videotape, and a tracking form to give the clinician. They subsequently received newsletters that

contained tips on smoking prevention and monthly mailings with information about smoking cessation contests and prizes. Of the 117 patients (77 women and 40 men) who completed follow-up surveys approximately seven months after the intervention, 14 percent of the women and 35 percent of the men reported that they had stopped smoking.

In a randomized, controlled trial to increase smoking cessation rates among African American clients of a community health center, smokers were randomly assigned to one of three conditions: prompting by a health care provider only, health care provider prompt plus tailored print communication, or health care provider prompt plus tailored print communication plus tailored telephone counseling (Lipkus et al. 1999). At follow-up, a significant difference was found in the cessation rate among those who received provider prompt plus tailored print media (32.7 percent) compared with those who received the health care provider prompt alone (13.2 percent) or the health care provider prompt plus tailored print communication plus tailored telephone counseling (19.2 percent) ($p < 0.05$).

A smoking cessation intervention program in a nontraditional venue was a program for mothers of children in the Head Start Program (Jones et al. 1994). In a population with a baseline smoking prevalence of 43 percent, abstinence was 11 percent immediately after the intervention and 12 percent at the six-month follow-up in the intervention group and only 3 and 6 percent, respectively, in the control group.

Fisher and colleagues (1998) evaluated a community organization approach in predominantly African American communities. Using a quasi-experimental design, this 24-month study involved three low-income, mainly African American, St. Louis (Missouri) neighborhoods in planning and implementing activities to promote nonsmoking. Intervention neighborhoods were compared with comparable control neighborhoods in Kansas City (Missouri). At least two-thirds of the neighborhood residents in both the intervention and control neighborhoods were women. Changes in prevalence of smoking were evaluated through random telephone surveys of the neighborhoods in 1990 and two years later. There were 504 respondents in St. Louis, the intervention site, and 1,040 in Kansas City, the control site, at baseline. The cross-sectional survey two years later, in 1992, questioned 547 individuals in St. Louis and 1,034 in Kansas City. Although smoking prevalence decreased overall among respondents in the intervention versus comparison communities (7 vs. 1 percent; $p = 0.028$),

the reduction in prevalence was not statistically significant among African Americans (5 vs. 1 percent; $p = 0.20$). An examination of smoking cessation rates by gender indicated that men were more likely to stop smoking than were women (RR, 1.6; 95 percent CI, 1.3 to 1.9).

A trial of smoking cessation through church-based programs among rural African Americans was conducted in two Virginia counties (Schorling et al. 1997). The intervention combined one-on-one counseling with self-help and community-wide activities. Population-based cohorts of smokers were contacted at baseline and at 18 months. At follow-up, the smoking cessation rate in the intervention county was 9.6 and 5.4 percent in the control county ($p = 0.18$). No difference was found by gender in smoking cessation rate.

Another study that targeted African Americans randomly assigned 22 churches predominantly attended by African Americans in Baltimore, Maryland, to an intensive intervention that included pastoral sermons, testimonies during church services, lay counselors, access to support, guides to cessation, and other materials or to a minimal self-help intervention (Voorhees et al. 1996). No significant differences in smoking cessation were observed between the trial arms. Gender was not a predictor of progress along the stages of change.

In a study of 410 inner-city African American cigarette smokers (61 percent females) who were interested in stopping smoking, Ahluwalia and colleagues (1998) enrolled participants in a randomized trial of the transdermal nicotine patch. No significant effects by gender were found in relation to abstinence at 10 weeks or at six months.

Hispanic Women

Little work has been published on smoking cessation among Hispanic women in the United States. NHIS data for 1993 showed that a high percentage of Hispanic smokers wanted to stop smoking—79.3 percent of Hispanic women and 63.8 percent of Hispanic men (USDHHS 1998). Reports have shown smoking among Hispanics in the United States to be positively associated with acculturation (Sabogal et al. 1989; Otero-Sabogal et al. 1995). On the basis of a telephone survey of Hispanics aged 15 through 64 years who were living in the San Francisco, California, metropolitan area, Marin and colleagues (1989) found a gender-specific difference in the relationship of acculturation to smoking: men who were less acculturated and women who were more acculturated were more

likely to smoke. Other investigators found that among smokers, more acculturated Hispanics had higher levels of addiction and lower levels of self-efficacy in smoking cessation than did less acculturated Hispanics (Sabogal et al. 1989). The Hispanic population in the United States represents a diverse group of subcultures and stages of immigration and acculturation, all of which should be taken into account in smoking cessation research.

In a study of cultural attitudes and expectations regarding smoking, Marin and colleagues (1990b) found no significant gender-specific differences among Hispanics, except that more women than men reported enjoyment in continued smoking. The study of 263 Hispanic smokers and 150 non-Hispanic white smokers in San Francisco found that Hispanic smokers and non-Hispanic white smokers held some different attitudes and expectations about smoking and cessation. Hispanics were significantly more certain than non-Hispanic whites that stopping smoking would provide a better example to their children, improve family relations, make breathing easier, and result in having a better taste in one's mouth. Hispanics were less likely than whites to smoke at home for relaxation or with meals. Also, fewer Hispanic smokers were certain that smoking cessation would bring withdrawal symptoms.

These findings have been incorporated into a self-help manual. Evaluation of the *Rompa con el Vicio: Una Guía para Dejar de Fumar* (USDHHS 1993c) self-help manual, which incorporated the findings described above, has shown that it was well received by Hispanic smokers. More than 20 percent of a sample of volunteers who picked up the manual at community stores or clinics reported having stopped smoking at 2.5 months after reading it, but this proportion declined to 13.7 percent after 14 months (Pérez-Stable et al. 1991). Telephone surveys conducted after implementation of a culturally appropriate, community-based smoking cessation program in the Latino community of San Francisco (Programa Latina para Dejar de Fumar) found that women were more likely than men to report awareness of the program and of the availability of printed information (Marin and Pérez-Stable 1995).

Lillington and colleagues (1995) published a report of a smoking cessation intervention for pregnant women that included 234 Hispanics among the 555 enrollees. Contrary to the study's results for African American women, this program did not significantly affect smoking cessation among Hispanic women, either at nine months' gestation or at six weeks after delivery.

A smoking cessation study that involved 93 Hispanic women and men in Queens, New York, found no difference in cessation at 12 months between a multicomponent, culturally specific intervention and a minimal-contact self-help program (Nevid and Javier 1997). Results were not significantly different by gender.

American Indian or Alaska Native Women

A number of factors not only complicate research on smoking patterns among American Indians and Alaska Natives but also seem to preclude generalization from one population to another. Specifically, reported smoking rates have varied widely among American Indian tribal affiliations and by geographic location, from as low as 13 percent among Navajos to as high as 70 percent among Indians outside the Southwest (Lando et al. 1992). Additionally, the type of cigarettes, manner of inhaling, and number of cigarettes smoked vary widely. Moreover, 54 percent of American Indians live in urban settings, and another large percentage live on rural reservations. No studies have addressed factors that may influence smoking cessation among American Indian or Alaska Native women specifically. A few studies that combined results for women and men have been reported.

NHIS data showed interest in smoking cessation among American Indians and Alaska Natives who smoked. In 1993, 70.3 percent of American Indian or Alaska Native women and 57.3 percent of men who smoked indicated that they would like to stop (USDHHS 1998).

A smoking cessation project in four urban Indian Health clinics enrolled 601 Native American smokers; they were randomly assigned to participate in a Doctors Helping Smokers model to increase smoking cessation (Johnson et al. 1997). After one year of treatment, the investigators found a higher rate of self-reported cessation in the treatment group than in the control group (7.1 vs. 4.9 percent), but cotinine levels indicated that cessation rates were comparable for both study arms. Rates were not reported separately by gender.

Recent work with the Lumbee Indians in North Carolina has explored the prevalence and predictors of tobacco use among Lumbee women (Spangler et al. 1997). Data have suggested that a church intervention would be a good approach for Lumbee women who have high rates of tobacco use. In a survey of 400 adult Lumbee Indians, 63 percent were church members, and a dose-response relationship was observed between church attendance and the number of cigarettes smoked per day (Spangler et al. 1998).

Asian or Pacific Islander Women

Because of the small sample sizes of Asians and Pacific Islanders who have participated in epidemiologic surveys and smoking cessation programs, little information has been available on cessation rates and associated factors (King et al. 1997). In one of the few studies that examined racial and ethnic differences in smoking behavior and attitudes among patients at physician practices, Asian smokers (women and men) reported significantly more pressure from friends to stop smoking than did white, African American, or Hispanic smokers. Asians and Hispanics were significantly more likely than the other racial and ethnic groups to report that not exposing their children to smoking was an important reason for quitting (Vander Martin et al. 1990). No studies of smoking cessation interventions among Asian or Pacific Islander women have been reported.

Older Women

Special Health Concerns and Smoking Cessation Needs Among Older Women Who Smoke

Older women have some unique smoking risks, including increased risk for postmenopausal osteoporosis (see “Menstrual Function, Menopause, and Benign Gynecologic Conditions” in Chapter 3). Although no studies have focused specifically on smoking cessation among older women, some studies have been able to analyze data for this group, with mixed results. Rimer and colleagues (1994) found that older men were more likely to quit than older women. On the other hand, Hill and colleagues (1993) found that older women were more likely to quit than older men. Yet another study found no differences in quitting between older women and older men (Ossip-Klein et al. 1997). More research is needed for this group.

Older women who smoke are less likely than older men who smoke to be married, to have at least a high school education, or to belong to community organizations and are more likely to be widowed, to live alone, to be unemployed, and to report an annual household income of less than \$25,000 (King et al. 1990; Orleans et al. 1990, 1991a; Bjornson et al. 1995). King and associates (1990) found that disparities between women and men aged 50 through 64 years in educational level and marital status were associated with continued smoking versus smoking cessation. Bjornson and colleagues (1995) reported similar results for participants in the Lung Health Study (mean age at entry into the study, 49 years).

The age gap in awareness of the health effects of smoking is just as apparent among women as it is among men (Orleans et al. 1990, 1994a), but some gender-specific differences have implications for treatment. In one study, older women aged 50 through 74 years who smoked were significantly less likely than their male counterparts to report that they had ever received advice from a physician to stop smoking (53 vs. 58 percent) (Orleans et al. 1994a). Nonetheless, significantly more of these women than men rated concerns about their future health (77 vs. 69 percent), their present health (62 vs. 52 percent), the effects of their smoking on others (40 vs. 31 percent), and the cost of smoking (38 vs. 26 percent) as important motives to stop smoking. Older women also were significantly more likely than older men who smoked to report weight gain (33 vs. 21 percent) or possible weight gain (30 vs. 18 percent) as important barriers to smoking cessation. As Gritz (1994) pointed out, women’s greater difficulty in controlling their weight in the perimenopausal and postmenopausal periods may prove to be an additional barrier to smoking cessation.

Promising Treatment Approaches for Older Women Who Smoke

The 1990 Surgeon General’s report on the health benefits of smoking cessation (USDHHS 1990) declared older adults in the United States to be an important target for national smoking cessation initiatives. These initiatives spurred new efforts to develop and evaluate smoking cessation treatments for this population. Several studies have indicated that older adults, both women and men, benefit from a variety of smoking cessation treatments and are at least as likely as younger smokers to succeed in stopping smoking, either on their own or with the aid of a formal clinic, self-help, or pharmacologic treatment (Vetter and Ford 1990; Hill et al. 1993; Orleans et al. 1994b; Rimer et al. 1994; Morgan et al. 1996; Ossip-Klein et al. 1997). No studies have examined treatments specifically tailored for older women, but one study found that *Clear Horizons*, a self-help guide tailored for all older adults, proved more effective at a 12-month follow-up than did a generic smoking cessation guide designed for smokers of all ages (Rimer et al. 1994).

Evidence of gender-specific differences in smoking cessation outcomes among older smokers has not been consistent. Hill and colleagues (1993) reported a higher percentage of biochemically verified or informant-verified cessation among older women

than among older men after an intensive three-month group treatment program that involved behavioral training alone, behavioral training with nicotine gum, behavioral training with physical exercise, or physical exercise only. Participants were aged 50 years or older and had smoked for at least 30 years. Rimer and colleagues (1994) assigned persons aged 50 through 74 years to three study groups: those who received the *Clear Horizons* guide plus two reinforcing telephone calls, those who received the guide alone, and those who received the generic NCI smoking cessation guide, *Clearing the Air* (control group). In all three groups combined, the investigators found that the three-month, self-reported cessation was significantly higher among men than among women (13 vs. 8 percent). In a recent study of smokers aged 60 years or older using the *Clear Horizons* guide, Ossip-Klein and colleagues (1997) found that a higher percentage of women stopped smoking if they received two proactive telephone calls along with the guide, whereas the percentage of men who stopped was higher if they received the guide with two mailed prompts to call a smoking cessation helpline. Orleans and colleagues (1994b) found no gender-specific differences at six-month follow-up in the percentage of smokers

aged 65 through 74 years who filled prescriptions for transdermal nicotine.

Two randomized controlled trials of older adults seen in primary care settings found that brief intervention doubled the number of persons who stopped smoking (Vetter and Ford 1990; Morgan et al. 1996). Neither Morgan and colleagues (1996) nor Vetter and Ford (1990) reported gender-specific differences.

Dale and colleagues (1997) found a 24.8-percent six-month cessation rate among 615 women and men patients aged 65 through 82 years who received brief smoking cessation consultation that combined behavioral counseling with recommended pharmacologic aids. Orleans and colleagues (1994b) found a self-reported six-month cessation rate of 29 percent among low-income women and men smokers aged 65 through 74 years who had received transdermal nicotine with minimal smoking cessation advice or who had received help from their health care providers. More frequent contact with physicians or pharmacists was associated with more appropriate use of the patch (e.g., less concomitant smoking) and a higher percentage of cessation. Neither study reported results by gender.

Programmatic and Policy Approaches to Smoking Cessation

Worksite Programs to Reduce Smoking Among Women

Almost two-thirds of women between 20 and 65 years of age are in the labor force in the United States (U.S. Department of Commerce 1993). Consequently, workplace programs to reduce smoking can reach a large segment of women who smoke. A review of quitting among those who participate in smoking cessation programs conducted in worksites suggested that women and men are equally likely to stop smoking in programs conducted at the site. Mixed results have been found, however, for the effect of worksite-wide cessation activities among all smokers at the site. Of three studies, one had an overall effect and two did not. However, only one study analyzed data by gender (Gritz et al. 1998); an effect was found among women in the treatment arm compared with women in the control arm. More studies need to conduct

separate analysis by gender. Similarly, examination of the effects of restrictive worksite smoking policies on cessation indicated an overall effect; however, few studies reported the data by gender.

Prevalence of Worksite Smoking Control Interventions

On-Site Smoking Cessation Activities

On-site smoking cessation activities include intensive multisession groups similar to clinic programs, self-help individual or group programs, stop-smoking contests, and learning opportunities such as lung function tests and alveolar carbon monoxide readings. At the less intensive end of the spectrum are activities such as distributing literature on smoking cessation or on risks from smoking. The Office of Disease Prevention and Health Promotion of USDHHS sponsored two national surveys (in 1985 and 1992)

that assessed the prevalence of a variety of worksite health promotion activities. (See Fielding and Piserchia 1989 and USDHHS 1993a for a description of the methods and basic findings of the 1985 and 1992 surveys, respectively.) Each survey included a probability sample of about 1,500 private worksites that employed 50 or more workers. In 1985, about 14 percent of worksites offered some sort of “participatory” smoking cessation activity (counseling, classes, or special events) and about 19 percent offered information in the form of brochures, cessation manuals, and posters. In 1992, approximately 22 percent of all worksites offered participatory activities and approximately 36 percent offered informational resources (USDHHS 1993b). Both surveys found that cessation activities were substantially more prevalent among the larger worksites than among the smaller worksites. Worksite resources also varied according to industry (Table 5.1). Worksites in the utilities, transportation, and communication industries were most likely to offer on-site activities, and those in the wholesale and retail industries were least likely to do so.

Restrictive Smoking Policies

Restrictive smoking policies are often seen as a facilitator of smoking cessation. The growth of worksite smoking restrictions has been dramatic (Fielding and Piserchia 1989; USDHHS 1993a). In 1985, 27 percent of the worksites sampled reported having a “formal policy restricting smoking.” At that time, any policy that limited smoking to particular areas or times (e.g., only during breaks or lunch) was considered a formal smoking policy. The 1992 survey, which posed the question more explicitly, found that 59 percent of worksites either banned indoor smoking entirely or restricted it to separately ventilated areas. Another 28 percent restricted smoking to designated areas without separate ventilation.

As with on-site smoking cessation activities, restrictive smoking policies are more common in larger worksites. Among the smallest sites surveyed in 1992, 32 percent reported being smoke-free; among the largest sites, 55 percent were smoke-free. Restrictive policies were most prevalent in the service and

Table 5.1. Women’s access to worksite tobacco control resources in various industries during the 1990s

| | Industry | | | | | |
|--|---------------|----------------------|----------|--|---------------------------------|-------|
| | Manufacturing | Wholesale and retail | Services | Utilities, transportation, communication | Finance, insurance, real estate | Other |
| Percentage of private worksites with smoking cessation activities, 1992* | 44.6 | 33.1 | 40.8 | 49.0 | 40.4 | 36.7 |
| Percentage of private worksites with ban on indoor smoking, 1992* | 28.3 | 26.5 | 41.7 | 34.5 | 42.0 | 35.3 |
| Percentage of women reporting smoke-free worksites | | | | | | |
| 1993 [†] | 36.9 | 31.8 | 63.1 | 52.4 | 56.1 | 33.5 |
| 1996 [‡] | 55.7 | 52.7 | 77.5 | 71.9 | 73.5 | 60.2 |
| Percentage of current smokers among women, 1996 [§] | 27.1 | 29.1 | 18.8 | 22.5 | 19.5 | 21.1 |

*U.S. Department of Health and Human Services 1993b.

[†]U.S. Bureau of the Census, National Cancer Institute Tobacco Use Supplement, public use data tape, 1992–1993.

[‡]U.S. Bureau of the Census, National Cancer Institute Tobacco Use Supplement, public use data tape, 1995–1996.

[§]In 1996, 12.5% of employed women worked in manufacturing; 21.8% in wholesale and retail; 46.4% in services; 4.1% in utilities, transportation, communication; 8.4% in finance, insurance, real estate; and 6.8% in other industries.

financial industries and least prevalent in the wholesale and retail industry. Surveys of women workers about worksite smoking policies in 1993 and 1996 reflected the same industry differences that emerged from the national worksite surveys in 1985 and 1992 (Table 5.1).

Women's Access to Worksite Smoking Control Resources

Women tend to be segregated into particular industries, and smoking prevalence varies markedly by industry. For example, in 1996, 46.4 percent of employed women were working in the service industry (Table 5.1). Of those women, 37.6 percent were employed in professional services such as health and education, and a subset (8.7 percent) were employed in business or personal services such as advertising, data processing, hotels, and entertainment. The prevalence of smoking among women in these service industries was lower (18.8 percent) than that among women in other industries. The service industry ranked first of five major industries in the prevalence of women who reported smoke-free worksites and third in the prevalence of smoking cessation activities. The next largest employer of women was the wholesale and retail industry, which included 21.8 percent of working women in the United States. The smoking prevalence among women was much higher in this industry (29.1 percent) than in the service industry, and this industry ranked lowest in the prevalence of smoke-free worksites and in the prevalence of worksite smoking cessation activities.

Efficacy of Worksite Interventions for Women Who Smoke

On-Site Smoking Cessation Activities

To ascertain the efficacy of on-site worksite smoking cessation programs, Fisher and associates (1990b) performed a meta-analysis. The analysis included 20 controlled studies of worksite smoking cessation programs conducted between 1984 and 1990. For 18 of the 20 studies, the cessation proportion was defined as the percentage of program participants who stopped smoking. For the remaining two studies, the cessation proportion was based on smokers in the worksite as a whole. The authors determined that participating in an intervention worksite smoking cessation program increased the likelihood of smoking cessation by 58 percent over being in the control group or comparison group. The percentage of women versus men in the treatment conditions did not appear to be associated with the proportion who

stopped smoking, a finding that suggested that women and men who participated were equally likely to stop smoking.

The effect of worksite smoking cessation activities on the smoking behavior among all smokers at the worksite has been investigated in three multisite, randomized trials with multiple risk factors; each of these trials involved sustained interventions over several years (Jeffery et al. 1993; Glasgow et al. 1995; Sorensen et al. 1996). In each case, the outcome variable was either the change in smoking prevalence in the participating worksites from baseline to the end of the intervention period or the difference in the proportion of those who stopped smoking in intervention versus comparison sites. Before-and-after surveys were conducted on cross-sectional and cohort samples of entire worksite populations. Only one study (Jeffery et al. 1993) demonstrated a significant reduction in smoking prevalence among both women and men combined in intervention versus comparison sites.

The Healthy Worker Project (Jeffery et al. 1993) randomly assigned 32 worksites to a group that received two-year smoking cessation treatment or to a control group that received no treatment. In the treatment group, 11-session classes given by professional health educators were repeatedly offered to all smokers. Smoking prevalence at the treatment sites decreased by 2 to 4 percentage points among women and men combined, whereas it increased by 1 percentage point at the comparison sites, a statistically significant effect. Slightly more than one-half of the employees and approximately two-thirds of program participants were women, but differences in the effect of the program were not reported by gender.

The Take Heart Project (Glasgow et al. 1995) randomly assigned 26 sites to an 18-month, multifaceted tobacco control and nutrition intervention or to a control condition. Results indicated that smoking prevalence dropped by 3 to 5 percentage points in both the intervention and control conditions, and no significant benefit of the intervention was discernible. A replication of the Take Heart trial suggested that smoking prevalence decreased at the intervention worksites, but the differences were not significant (Glasgow et al. 1997b). The data were not reported by gender.

The Working Well Trial (Sorensen et al. 1996) tested the effectiveness of a worksite smoking cessation intervention at 84 worksites. The sites were randomly assigned to an intervention program or to a comparison program. Intervention sites received an intensive series of programs that was geared for all levels of

readiness to stop smoking and that was directed both at individual workers and the worksite environment. Comparison sites received either no intervention or a minimal intervention consisting of posters and self-help manuals. Results indicated a decline in smoking prevalence of 3 to 4 percentage points among both the intervention and comparison sites. Although the proportion of smokers who stopped smoking was slightly higher in the intervention sites than in the comparison sites (13.8 vs. 12.3 percent), the difference was not statistically significant. A subsequent analysis of data from the Working Well Trial examined smoking cessation results among women and men separately (Gritz et al. 1998). Results demonstrated a significant effect among women but not among men. Women at the intervention worksites were 1.5 times as likely to stop smoking as women at the comparison worksites (see "Cessation Activities in Occupational Settings for Women of Low Socioeconomic Status" earlier in this chapter).

Restrictive Smoking Policies

There is reason to expect that a restrictive smoking policy would contribute to heightened cessation among smokers because of its effect on motivation and on reducing cues that could trigger relapse (Walsh and Gordon 1986; Biener et al. 1989a). Although consistent evidence has indicated that restrictive policies reduce the number of cigarettes consumed daily (Biener et al. 1989b; Borland et al. 1990; Brigham et al. 1994), evidence for increased cessation has been more ambiguous. In a study in which data were gathered on employed women and men who were current or former smokers, multivariate analyses were used to examine associations between worksite smoking policies and cessation, with smoking status the response variable in logistic regression (Brenner and Mielck 1992). The study included 98 women smokers, of whom 66 were allowed to smoke at the workplace and 31 were not; 45 percent of the women not allowed to smoke at the workplace stopped smoking, whereas 18 percent of women allowed to smoke at the workplace stopped (RR, 0.2; 95 percent CI, 0.1 to 0.5). This result suggested that, at least among women, restrictive worksite policies were useful for encouraging cessation. Patten and colleagues (1995a) analyzed the cessation proportion in a representative sample of California workers who were followed up over two years as a function of the worksite smoking policy they reported at each assessment. The cessation rate for smokers continuously employed at a smoke-free site was more than double

the rate for those continuously employed at a non-smoke-free site (21.7 vs. 9.2 percent). In a separate analysis of the 1990–1992 longitudinal sample of the California Tobacco Survey, Pierce and colleagues (1994a) provided additional evidence for the efficacy of worksite smoking bans. Using an index of progress toward smoking cessation that has been shown to have predictive validity and controlling for demographic characteristics, they demonstrated that workers employed at smoke-free sites in 1992 were significantly more likely than those not employed at smoke-free sites to have made progress toward smoking cessation. Similarly, a longitudinal analysis of data collected for COMMIT found that among persons who were smokers in 1988, those who reported working in a smoke-free worksite in 1993 were 25 percent more likely to have stopped smoking during the intervening period than those employed in sites with less restrictive policies (Glasgow et al. 1997a).

Analyses of the Massachusetts Tobacco Survey, a telephone survey of a representative sample of adults in Massachusetts conducted by the Center for Survey Research at the University of Massachusetts (Boston) in 1994, indicated that restrictive policies may be particularly beneficial for women who smoke (Lois Biener, unpublished data). Controlling for daily smoking rate, the researchers found that both women smokers and men smokers employed at smoke-free worksites reported smoking significantly fewer cigarettes during working hours than did their counterparts employed at sites where some smoking was permitted. When asked whether they smoked less at work because of the worksite policy, women were more likely than men to answer in the affirmative (85 vs. 66 percent). Women were also significantly more likely than men to attribute a reduced overall rate of daily smoking to their worksite policy (73 vs. 54 percent).

Community-Based Efforts to Reduce Smoking Among Women

Community studies offer opportunities for all smokers in a community to receive messages and assistance in smoking cessation. In the dozen or so community studies that have been conducted, the results have been mixed. Recent outcomes of community studies in the United States have tended to show few, if any, differences in smoking cessation between women and men (Fortmann et al. 1993; Commit Research Group 1995a,b; Lando et al. 1995; Winkleby et al. 1997). Some studies in other countries (e.g., Africa, India) have shown differences in cessation between

women and men. In these studies, women were more likely to quit (Steenkamp et al. 1991; Anantha et al. 1995). It is unclear why such differences exist.

Community Studies of Smoking Cessation

Several community studies have been conducted to investigate behavioral risk factors related to cardiovascular disease (Farquhar et al. 1977; Maccoby et al. 1977; Farquhar 1978; McAlister et al. 1982). Smoking cessation was one of the behavior changes addressed. Only one randomized study in the United States, COMMIT, focused exclusively on smoking cessation (COMMIT Research Group 1991, 1995a).

Table 5.2 summarizes the community studies. The types of smoking changes reported in community studies have varied widely. Some studies reported net differences in changes from baseline prevalence between intervention and comparison communities. Others reported before-and-after changes in prevalence for intervention communities only. Still others reported on smoking cessation in a cohort of smokers followed up over time or in a group of smokers asked retrospectively about their smoking behavior. Finally, some studies reported changes in the number of cigarettes smoked. Not all studies reported on smoking cessation or prevalence among women and men separately. The cessation proportion is presented as the percentage of the cohort (intervention or control) that stopped smoking. Significance tests are based on comparisons between intervention communities and control communities in the change in smoking prevalence or cessation proportion.

The Community, Hypertension, Atherosclerosis, and Diabetes Program (CHAD) was initiated in Israel in 1970. It was a community-based program directed at reducing cardiovascular risk factors among residents of four adjacent housing projects (Abramson et al. 1981). Survey assessment at baseline (1970) and 5 years later (1975) showed a net decrease in smoking prevalence among women that was far less than that among men and was not significantly different from that in the control community. By 10 years after intervention, however, net decreases in smoking prevalence were significantly greater in the intervention sites than in the control sites among both women and men, and the declines were greater than those seen in the rest of Israel for the same period (Gofin et al. 1986).

Both the Stanford Three-Community Study and the Finnish North Karelia Project commenced in 1972. Both projects used mass media; Stanford also used intensive face-to-face intervention for persons at high risk for smoking-related diseases (Farquhar et al. 1977;

Maccoby et al. 1977), and the North Karelia Project used community organization, environmental modification, and educational programs (Salonen et al. 1981; McAlister et al. 1982; Puska et al. 1983b). The Stanford study did not report overall results among women and men separately. In the North Karelia Project, significant differences between the intervention and control counties in smoking prevalence occurred among men but not among women (Salonen et al. 1981; Puska et al. 1983b).

A series of community-based antismoking campaigns in Australia that began in 1978 used mass-media and community programs to encourage smoking cessation. Significant differences in the change in smoking prevalence among women were found in the North Coast study (Egger et al. 1983) and the Sydney study (Dwyer et al. 1986), but the results for the Melbourne study (Pierce et al. 1990) were less clear. In the North Coast study, women and men aged 18 through 25 years had lower smoking prevalence in both intervention communities than did women and men aged 65 years or older (Egger et al. 1983). The reductions in prevalence in all age groups were more pronounced in the media plus community programs' town than in the media only town. In Melbourne, the prevalence of smoking among women with at least some university education declined by 23 percent, the largest rate of decline among all the groups in either the intervention city or control city (Macaskill et al. 1992).

The Coronary Risk Factor Study (CORIS) conducted in three rural South African cities with both white and black Afrikaner residents used small media (posters, billboards, newspapers, and direct mail) to encourage persons to lower their risk factors for coronary artery disease, including smoking (Steenkamp et al. 1991). The media campaign was supplemented in one of the cities with an interpersonal intervention for high-risk persons. This intervention included an intensive smoking cessation program. Net decreases in the prevalence of smoking among women ranged from 3.0 to 4.0 percentage points in the two intervention communities. Among men, the net difference between the intervention and control cities was an increase in smoking prevalence of 0.9 percentage points in the city with only a media campaign and a decrease of 3.7 percentage points in the city with media plus intervention. The percentage of women who stopped smoking was significantly higher in the intervention cities than in the control city and was also higher than that among men.

Three community-based projects to reduce coronary heart disease were the Stanford Five-City Project, the Minnesota Heart Health Program, and the

Pawtucket Heart Health Program (Winkleby et al. 1992, 1997; Fortmann et al. 1993). Each had intervention and control cities and used a variety of community-based programs, such as mass media, community education, and multiple education channels. In the Stanford Five-City Project, smoking cessation increased in cohorts of women and men in both the intervention and control cities, but the difference between cessation rates in these cities was significant only among men. Cross-sectional surveys also found that the prevalence of smoking decreased significantly among men, but not among women. The Minnesota Heart Health Program reported no significant differences in the prevalence of smoking cessation between cohorts in the intervention and control cities. However, cross-sectional surveys conducted annually showed an intervention effect among women of 1.3 percent overall above the secular trend ($p < 0.05$), but no significant effect among men (Lando et al. 1995; Winkleby et al. 1997). The Pawtucket Heart Health Program found no significant differences in the prevalence of smoking cessation between cohorts in the intervention and control cities followed up over time, but it did not report results of the cohort by gender (Carleton et al. 1995). A joint analysis of the cross-sectional data from these three studies found no significant decreases in smoking prevalence or increases in smoking cessation associated with the intervention among either women or men (Winkleby et al. 1997).

A six-year, three-community study (one intervention community and two control communities), initiated in India in 1986, focused solely on tobacco use. It sought to prevent initiation of tobacco use among nonusers and to encourage cessation among users. Prevalence of tobacco use was higher among women than among men at baseline, but 99 percent of the women tobacco users chewed tobacco or used snuff instead of smoking tobacco. The total prevalence of tobacco use decreased significantly more in the intervention community than in the control communities, and the differences were greater among women than among men (Anantha et al. 1995).

COMMIT recruited 11 pairs of communities, focused exclusively on smoking cessation, and used the community as the unit of both randomization and analysis (COMMIT Research Group 1995a). Cohorts of heavy smokers (≥ 25 cigarettes per day) and light or moderate smokers (<25 cigarettes per day) were followed up annually. A cross-sectional survey also

was conducted at baseline and again at the end of the study. In the cohort of heavy smokers, no significant intervention effect on the proportion who had stopped smoking was found. Although men were significantly more likely than women to stop smoking, this difference disappeared when treatment condition, age, and education were controlled for. In the cohort of light or moderate smokers, smokers in the intervention cities stopped smoking in significantly higher proportions than did smokers in the control cities, but fewer women than men stopped. No significant interaction of gender by treatment was observed (COMMIT Research Group 1995b).

A number of smaller, nonrandomized community studies have been conducted in recent years. In a quasi-experimental design, Fisher and colleagues (1998) organized three low-income, predominantly African American neighborhoods in St. Louis, Missouri, to promote nonsmoking, and compared the outcomes with those in three similar neighborhoods in Kansas City, Missouri (see "Other Cessation Programs for African American Women" earlier in this chapter). The investigators found significant treatment effects, and men were significantly more likely than women to stop smoking (RR, 1.6; 95 percent CI, 1.3 to 1.9).

A community-wide cable program used a time-series design to assess the effectiveness of cable television in promoting smoking cessation (Valois et al. 1996). At one year, the cessation rate was 17 percent. This percentage compared favorably with other televised cessation programs.

A number of other community smoking cessation intervention programs are in progress. These include the American Stop Smoking Intervention Study (ASSIST), which was initially funded by NCI and the American Cancer Society and has now been transferred to CDC; the SmokeLess States program funded by the Robert Wood Johnson Foundation; and Initiatives to Mobilize for the Prevention and Control of Tobacco Use (IMPACT), another CDC-funded program. In combination with concurrent activities at the federal, state, and local levels, these efforts to control tobacco use hold considerable promise for reducing smoking among women. An interim analysis found that by 1996, per capita tobacco consumption was 7 percent lower in the 17 states participating in the ASSIST program than in the 32 non-ASSIST states (Manley et al. 1997). However, results by gender have not yet been published.

Table 5.2. Changes in smoking behavior reported in studies of community-based smoking cessation programs

| Project | Community | | Percentage point change in smoking prevalence of intervention vs. control community | | Percentage of intervention cohort or control cohort that quit smoking | | |
|--|--------------------------------|------------------------------------|---|----------------------------|---|-------|----|
| | Intervention | Control | Women | Men | Women | Men | |
| Israel Community, Hypertension, Atherosclerosis and Diabetes Program (1971–1981) | 4 housing projects | 1 adjacent neighborhood | -0.5 (at 5 years) | -5.9* (at 5 years) | NA [†] | NA | |
| | | | -4.1* (at 10 years) | -7.2* (at 10 years) | NA | NA | |
| | | | | | NA | NA | |
| Stanford Three- Community Study (1972–1975) | 1 city with mass media only | 1 city | <u>Gender not reported</u> | | | | |
| | | | 3.6 | | NA | NA | |
| | | | -35.1* | | 47.0* | 52.0* | |
| Finland North Karelia Project (1973–1983) | 1 rural county | 1 matched neighboring county | -0.1 (at 5 years) | -1.3* (at 5 years) | NA | NA | |
| | | | -0.1 (at 10 years) | -2.7* (at 10 years) | NA | NA | |
| | | | | | NA | NA | |
| Australia North Coast (1978–1980) | 1 city with mass media | 1 city | -6.3 to 3.9* [‡] | -6.2 to -3.0* [‡] | NR [§] | NR | |
| | | | 1 city with mass media plus community programs | -10.5 to -4.0* | -10.7 to -4.8* [‡] | NR | NR |
| | | | | | | NR | NR |
| Sydney (1983–1984) | 1 city | rest of Australia | -0.9* | -1.4* | NR | NR | |
| Melbourne (1983–1988) | 1 city | 1 city | -5.0 to +5.0 | -3.0 to +1.0 | NA | NA | |

*p <0.05 vs. control community.

[†]NA= Not applicable; no cohort tracked.

[‡]Depending on age.

[§]NR = Not reported.

Depending on education.

Sources: **Community Hypertension, Artherosclerosis and Diabetic Program:** Abramson et al. 1981. **Stanford Three-Community Study:** Maccoby et al. 1977; Meyer et al. 1980. **North Karelia Project:** Puska et al. 1979, 1983a,b; Salonen et al. 1981. **North Coast study:** Egger et al. 1983. **Sydney study:** Dwyer et al. 1986. **Melbourne study:** Pierce et al. 1990. **Coronary Risk Factor Study:** Steenkamp et al. 1991. **Stanford Five-City Project:** Fortmann et al. 1993. **Minnesota Heart Health Program:** Lando et al. 1995. **Pawtucket Heart Health Program:** Carleton et al. 1995. **Anti-tobacco Community Education:** Anatha et al. 1995. **COMMIT:** COMMIT Research Group 1995a,b.

Table 5.2. Continued

| Project | Community | | Percentage point change in smoking prevalence of intervention vs. control community | | Percentage of intervention cohort or control cohort that quit smoking | |
|--|---------------------------|---------------------------|---|-------|---|---------------------|
| | Intervention | Control | Women | Men | Women | Men |
| Africa Coronary Risk Factor Study (1979–1984) | 1 high-intensity city | | -4.0* | -3.7 | 31.4* | 22.8 |
| | 1 low-intensity city | | -3.0 | 0.9 | 28.3* | 16.9 |
| | | 1 city | | | 15.5 | 20.1 |
| Stanford Five- City Project (1979–1985) | 2 cities | 3 cities | -0.6 | 1.02 | 4.8 5.6 | 10.9 2.3 |
| Minnesota Heart Health Program (1980–1990) | 3 cities | 3 cities | -1.3* | 0.01 | Differences reported to be not significant | |
| Pawtucket Heart Health Program (1981–1993) | 1 city | 1 city | <u>Gender not reported</u> 2.6 | | <u>Gender not reported</u> -8.9 -8.2 | |
| India Anti-tobacco Community Education [‡] | 1 area of 117 villages | 1 area of 126 villages | -13.4* | -8.1* | 36.7* | 26.5* |
| | | 1 area of 120 villages | | | 1.5 | 1.1 |
| | | | | | 0.5 | 1.1 |
| Community Intervention Trial for Smoking Cessation (COMMIT) (1988–1993) | 11 cities** | | <u>Gender not reported</u> -0.3 | | 17.6 ^{††} | 19.2 ^{††} |
| | | 11 cities** | | | 30.6* ^{‡‡} | 31.4* ^{‡‡} |
| | | | | | 17.6 ^{††} | 20.1 ^{††} |
| | | | | | 27.7 ^{‡‡} | 28.4 ^{‡‡} |

*p < 0.05 vs. control community.

[‡]Data reflect all tobacco use (i.e., cigarettes, oral tobacco). Only 1% of women smoked tobacco; most chewed or used snuff.

**Randomized.

^{††}Heavy smokers only.

^{‡‡}Light/moderate smokers only.

Tobacco-Related Policies: Attitudes and Effects

Since the first Surgeon General's report in 1964 on the health consequences of cigarette smoking, tobacco control policies have been an important component of the campaign to reduce tobacco use. Public attitudes toward these policies have been closely monitored through an array of public opinion surveys. Overall, few differences seem to exist between women and men and their attitudes toward tobacco-related

policies. Women, however, are more likely than men to believe that second-hand smoke is very harmful (Saad 1997), to support tax increases if they benefit the community (Gallup Organization 1993), to restrict areas where youth can purchase tobacco products (Strouse and Hall 1994), and to support restrictions on the advertising and marketing of tobacco (Biener et al. 1994; Pierce et al. 1994a; Strouse and Hall 1994). Findings on the effects of tobacco use policies have been more mixed. In policies restricting smoking in public places, few gender differences appear to exist. The

impact of taxation policies on women and men is mixed. Some studies indicated that women are less responsive than men to such policies (Chaloupka 1990, 1992; Chaloupka and Wechsler 1995), and others indicated that women are more responsive than men (Lewit et al. 1997; Chaloupka and Pacula 1998). Little information has been available about the effects of advertising and marketing restrictions on smoking onset or smoking cessation.

Monitoring Public Tobacco-Related Attitudes

Federal, state, and local governments have introduced policies that range from federally mandated health warnings on all cigarette packaging and a ban on smoking on all domestic airline flights, to increases in state tobacco taxes and local ordinances restricting smoking in restaurants. Some organizations and accrediting bodies have instituted tobacco control policies for their members. For example, since 1991 the Joint Commission on Accreditation of Healthcare Organizations has required hospitals to be smoke-free as a condition of their accreditation. Even in the absence of legislation or accreditation requirements, an increasing number of employers are instituting policies restricting or banning smoking at the workplace.

Several caveats must be noted in the interpretation of these studies. Surveys assessing attitudes toward smoking policies have seldom been based on national random samples, thus limiting the generalizability of the findings. The few surveys that have included national random samples (Gallup Organization 1993; Strouse and Hall 1994) are generally of limited scope. In contrast, two surveys in Massachusetts (Biener et al. 1994) and California (California Department of Health Services, public use data tape, 1994) assessed a wide array of attitudes. These are states with progressive legislation supporting tobacco control, and the results of these surveys may not be representative of national opinions. The COMMIT project, representing a diverse set of communities, found little variation across communities in attitudes toward tobacco control policies (CDC 1991). Any differences in attitudes toward such policies among women and men may be related to differential smoking prevalence, which is a confounder that may not be measured in opinion surveys.

Policies Restricting or Prohibiting Smoking

With increasing evidence of the health effects of exposure to ETS, policies prohibiting smoking in public places have multiplied. Restrictions on smoking

have been legislated by state and local clean indoor air laws and have been adopted in worksites through the initiatives of individual employers or managers (see "Worksite Programs to Reduce Smoking Among Women" earlier in this chapter). Several studies have reported that women are more likely than men to work in places where smoking is restricted (Borland et al. 1992; Patten et al. 1995b; Gerlach et al. 1997; Royce et al. 1997) and that women report lower levels of workplace exposure to ETS (Borland et al. 1992; Patten et al. 1995b) and higher levels of compliance with smoking policies in their places of employment (Sorensen et al. 1992a).

Attitudes Toward Restrictions and Prohibitions on Smoking

A 1997 poll showed that a majority of women and men in the United States believed that second-hand smoke is very harmful to adults and that this perception differs by gender (61 percent of women and 49 percent of men) (Saad 1997). These prevalences are substantial increases from a 1994 poll in which only 45 percent of women and 27 percent of men thought that second-hand smoke was very harmful to adults (Saad 1997).

In surveys conducted in the early to mid-1990s, only small gender-specific differences were observed in attitudes toward banning smoking in indoor work areas, restaurants, shopping malls, public buildings, and indoor sports or concert arenas (Table 5.3). Other surveys have assessed employee attitudes toward policies restricting or prohibiting smoking in their own worksite. Support for such policies is generally high, and the few studies that have included gender in their analyses have found no differences in women's and men's attitudes toward these policies (Borland et al. 1989).

Effects of Policies Restricting or Prohibiting Smoking

A few studies have evaluated how legislation restricting or banning smoking affects smoking behavior. Chaloupka (1992) assessed the effect of clean indoor air laws on average cigarette consumption, by participants' state of residence. The laws were associated with significantly diminished average cigarette consumption. However, the effect of these laws differed by gender: average consumption among men was reduced after passage of these laws, whereas women's consumption was unaffected.

Two studies have focused on the effect of restrictions on smoking among young people. By using data from a nationally representative survey of students in

Table 5.3. Support for policies that prohibit smoking in public places, by gender

| Study | Location | Gender | Location of ban (% supporting policy) | | | | |
|------------------------------------|-------------------------|--------|---------------------------------------|-------------|----------------|------------------|---------------------------------|
| | | | Indoor work areas | Restaurants | Shopping malls | Public buildings | Indoor sports or concert arenas |
| Forster et al. 1991 | 7 Minnesota communities | Women | | | | 49 | |
| | | Men | | | | 46 | |
| California Tobacco Survey 1993* | California | Women | | 41 | | | |
| | | Men | | 37 | | | |
| Massachusetts Tobacco Survey 1993† | Massachusetts | Women | | 49 | | 49 | 64 |
| | | Men | | 46 | | 43 | 52 |
| Shopland et al. 1995 | Maryland | Women | 62 | 47 | 54 | | 66 |
| | | Men | 57 | 46 | 50 | | 62 |

*Technical Report on Analytic Methods and Approaches Used in the 1993 California Tobacco Survey Analysis (Pierce et al. 1994a).

†1993 Massachusetts Tobacco Survey—Tobacco Use and Attitudes at the Start of the Massachusetts Control Program (Biener et al. 1994).

U.S. colleges and universities, Chaloupka and Wechsler (1995) estimated the effects of smoking restrictions among adolescents and young adults. Relatively stringent restrictions on smoking in public places were associated with lower prevalences of smoking, and any restrictions on smoking in public places were associated with smoking fewer cigarettes by smokers. School-based restrictions were associated with lower smoking prevalence among male students but were unrelated to smoking among female students. In contrast, the presence of smoking restrictions in restaurants was associated with lower smoking prevalence among female but not male students. Chaloupka and Pacula (1998) found that restrictions on smoking in public places significantly reduced smoking among male but not female students.

Several studies have examined the effect of restrictions on smoking in the workplace that were implemented independently of legislation (see “Worksite Programs to Reduce Smoking Among Women” earlier in this chapter). One policy analysis suggested that the proportion of women in a workplace had a positive effect on the imposition of smoking restrictions, but no significant effect was found on whether the worksite had a formal, written smoking policy (Gurdon and Flynn 1996). Most studies that have included gender-specific comparisons in their

analyses, however, found no significant differences in the effect of these policies on smoking cessation (Millar 1988; Biener et al. 1989b; Stillman et al. 1990; Borland et al. 1991). One larger study assessed perceptions of smokiness and reactions to ETS exposure in 114 worksites in the Working Well Trial and found that although gender-specific differences were small, women were significantly more likely than men to perceive their worksite as smoky (Thompson et al. 1995). However, women were no more likely than men to report being bothered by ETS in the workplace. On the other hand, 1992 NHIS data showed that women exposed to smoking in their immediate work area were more likely than men exposed to ETS to report being bothered by cigarette smoke (see “Exposure to Environmental Tobacco Smoke” in Chapter 2). One assessment of the relationship between worksite smoking prohibitions and smoking cessation, based on a German national sample (Brenner and Mielck 1992), found that cessation, as measured by the percentage of persons who had ever smoked who were currently former smokers, was significantly higher among women who worked where smoking was banned than among those who worked where smoking was permitted. A similar trend was noted among men, but it was not statistically significant.

Pricing and Taxation Policies

Cigarette price is a major determinant of cigarette consumption and one that can be influenced by tobacco tax policy (Lewit and Coate 1982; Wasserman et al. 1991; Peterson et al. 1992; Emont et al. 1993; Keeler et al. 1993; Meier and Licari 1997; Biener et al. 1998; CDC 1999). After the 1964 Surgeon General's report on the health consequences of smoking was published, states began to increase the tax on cigarettes as a means of discouraging smoking (Warner 1981). In recent years, some states have used revenues from tobacco taxes toward promotion of tobacco control.

Attitudes Toward Taxation Policies

Most surveys that assessed overall public support for tax increases on tobacco observed small or no differences by gender. The 1993 California Tobacco Survey (California Department of Health Services, public use data tape, 1994) found that comparable percentages of women and men wanted to see an increase in the tobacco tax (52 vs. 49 percent). With one exception, related to the amount of the increase, little evidence indicated that women and men differed in their support for increased taxes (Forster et al. 1991; California Department of Health Services, public use data tape, 1994). The Massachusetts Tobacco Survey (Biener et al. 1994) found that women endorsed somewhat smaller cigarette tax increases per pack on average than did men (\$1.47 vs. \$1.81).

Women and men tend to differ in their support for tax increases, depending on the proposed use of the funds generated. A Gallup Organization poll (1993) of U.S. adults found that women were somewhat more likely than men to support an increased tobacco tax if they knew the funds would be used for community benefits such as supporting national health care (76 vs. 66 percent), rebuilding inner cities (52 vs. 45 percent), encouraging smokers to stop smoking (64 vs. 56 percent), and preventing smoking initiation among youth (76 vs. 71 percent). Similarly, a survey of Minnesota residents (Forster et al. 1991) found that women were significantly more likely than men to strongly support tax incentives to employers for smoking cessation programs at work (43 vs. 33 percent). The Massachusetts Tobacco Survey (Biener et al. 1994) found only small differences between women and men in support for additional tobacco taxation if the funds would be used for smoking reduction (80 vs. 76 percent), smoking and health programs (76 vs. 70 percent), or general government purposes (31 vs. 32 percent).

Effects of Taxation Policies

The effects of taxation policies on smoking consumption has been assessed by using the standard economic estimate of the price elasticity of demand, which is the percentage change in quantity of cigarettes demanded resulting from a 1-percent change in price. Estimates of the price elasticity of demand for cigarettes vary with the methods used and the populations studied. The 1989 Surgeon General's report on the health consequences of smoking (USDHHS 1989) estimated it to be -0.47, meaning that a 10-percent increase in cigarette prices would result in an overall drop of 4.7 percent in the number of cigarettes demanded (Peterson et al. 1992). Estimated reductions in demand then result in increased smoking cessation, reductions in the number of cigarettes smoked, and prevention of smoking initiation among adolescents and children.

At least eight studies have assessed gender-specific differences in the effect of cigarette pricing on consumption, with inconsistent results. Four studies of U.S. adults concluded that women's cigarette consumption is less responsive to changes in cigarette prices than is men's (Lewit and Coate 1982; Mullahy 1985; Chaloupka 1990, 1992). A fifth study focused on the effect of cigarette pricing on smoking among U.S. college-age young adults. It found that the prevalence of smoking was more sensitive to price among the female students than among the male students but that the average cigarette consumption was more sensitive to price among the male students than among the female students (Chaloupka and Wechsler 1995). In contrast, several studies of U.S. high school students found that price had a larger effect on smoking prevalence among boys but a larger effect on average consumption among girls (Lewit et al. 1997; Chaloupka and Pacula 1998). Finally, one U.S. study and two British studies found that women's cigarette consumption was more responsive to price than men's and that women older than 45 years were more likely to buy generic brand cigarettes in response to price increases (Atkinson and Skegg 1973; Townsend et al. 1994; Cavin and Pierce 1996).

The effect of pricing on cigarette consumption is likely to be greatest among those with fewer economic resources, including adolescents and persons with low income. Several studies have found that cigarette pricing has larger effects among young people than among adults and that pricing changes are more likely to affect adolescents' decisions to smoke than the amount they smoke (Lewit and Coate 1982; Chaloupka and Pacula 1998). Other investigators have reported

that smokers of low SES are especially responsive to price changes (Townsend 1987; Biener et al. 1998; CDC 1998c). Proposals to increase cigarette taxes to promote tobacco control among low-SES groups have raised some objections. The economic pressures of low-income families may directly contribute to their high smoking prevalences (Graham 1984, 1990; Marsh and McKay 1994). Reducing smoking in these population groups may require broader social policies that address underlying economic discrepancies.

Policies Restricting Youth Access to Tobacco

Smoking is typically initiated during adolescence. Results of the 1991 National Household Surveys on Drug Abuse indicated that among persons who had ever tried a cigarette, 88 percent had tried their first cigarette by 18 years of age. Of those who had ever smoked daily, 71 percent did so by age 18 years (USDHHS 1994).

Attitudes Toward Restrictions on Youth Access

In general, adults strongly and consistently support curbs on minors' access to tobacco products, including access through vending machines. Women are generally more supportive of eliminating vending machines than are men, especially where the machines are accessible to youth (Table 5.4).

Public opinions toward other restrictions on youth access were assessed in the Robert Wood Johnson Youth Access Survey, a national opinion poll conducted in 1994 (Strouse and Hall 1994). Significantly more women than men supported requiring retailers to keep tobacco products behind the counter to prevent shoplifting by minors (83 vs. 71 percent) and supported allowing sale of cigarettes only in certain stores, as with alcohol (53 vs. 39 percent). No differences by gender were noted in support for requiring clerks to check identification of persons who appear underage or for increasing the legal age for sale of cigarettes to either age 19 years or age 21 years.

Effects of Restrictions on Youth Access

The effect of increased restrictions on use of tobacco among youths is not yet clear. Chaloupka and Pacula (1998) reported that the minimum age for legal purchase of cigarettes was significantly associated with reduced smoking prevalence and lower average consumption among boys, but not among girls. Even in the presence of such laws, girls may have more access to tobacco than do boys. Four studies have reported that girls were able to purchase tobacco with greater ease than were boys (Altman et al. 1989; Forster et al. 1992; Commonwealth of Massachusetts 1994; DiFranza et al. 1996). One of these studies reported that girls and boys were equally likely to be

Table 5.4. Support for restrictions on vending machines, by gender

| Study | Location | Gender | Type of restriction (% supporting policy) | |
|--|---------------|--------|---|--|
| | | | Eliminate all vending machines | Eliminate vending machines where teenagers have access |
| Forster et al. 1991 | Minnesota | Women | 39 | 62 |
| | | Men | 32 | 56 |
| California Tobacco Survey 1993* | California | Women | | 89 |
| | | Men | | 85 |
| Massachusetts Tobacco Survey 1993 [†] | Massachusetts | Women | 56 | 91 |
| | | Men | 53 | 94 |
| Mathematica 1994 [‡] | United States | Women | 79 | 94 |
| | | Men | 68 | 88 |

*Technical Report on Analytic Methods and Approaches Used in the 1993 California Tobacco Survey Analysis (Pierce et al. 1994a).

[†]1993 Massachusetts Tobacco Survey—Tobacco Use and Attitudes at the Start of the Massachusetts Control Program (Biener et al. 1994).

[‡]Robert Wood Johnson Foundation Youth Access Survey, December 1994 (Strouse and Hall 1994).

asked for proof of age when attempting to purchase cigarettes (DiFranza et al. 1996). A separate study by Altman and colleagues (1999) found that community interventions aimed at enforcement of restrictions on youth access resulted in a drop in the proportion of stores selling tobacco to minors from 75 percent to 0 percent at the final postintervention test in treatment communities. A significant intervention effect was found for gender in that females in the intervention communities were less likely to use tobacco after the intervention (which informed merchants of restrictions on youth access) than were females in the comparison communities; that association was not found among males.

Policies Restricting Advertising and Marketing of Tobacco Products

Attitudes Toward Restrictions on Tobacco Advertising and Marketing

In response to growing concern about the effect of tobacco advertising among children and adolescents

and in the face of tightening restrictions on tobacco advertising, several surveys have been conducted to assess public attitudes toward marketing restrictions. Five studies have indicated that women are more likely than men to support restrictions on marketing and advertising of tobacco (Table 5.5). An additional study similarly reported higher support from women than from men for other actions to restrict advertising that are designed to make cigarettes less appealing to children and adolescents, including support for “tombstone advertising” that would prohibit the use of visual appeals (77 vs. 69 percent), mandate plain packaging of cigarettes (51 vs. 42 percent), ban coupons for obtaining promotional items (79 vs. 61 percent), and eliminate the sale of single cigarettes (87 vs. 76 percent) (Strouse and Hall 1994).

In contrast, two studies have shown similarities in women’s and men’s support for advertising restrictions. A 1995 poll (Associated Press 1995) that assessed public support for President Bill Clinton’s efforts to limit tobacco advertising and promotion

Table 5.5. Support for restrictions on marketing and advertising of tobacco products, by gender

| Study | Location | Gender | Type of restriction (% supporting policy) | | | | |
|--|---------------|--------|---|----------------------|--|--------------------------|--|
| | | | Ban on all ads | Ban on billboard ads | Ban on tobacco ads in newspapers and magazines | Ban on sponsoring events | Ban on free cigarette samples in public places |
| Forster et al. 1991 | Minnesota | Women | | 48 | 45 | | |
| | | Men | | 42 | 37 | | |
| California Tobacco Survey 1993* | California | Women | 59 | 66 | 60 | 63 | 85 |
| | | Men | 50 | 56 | 50 | 50 | 76 |
| Gallup Organization 1993 | United States | Women | 62 | | | | |
| | | Men | 43 | | | | |
| Massachusetts Tobacco Survey 1993 [†] | Massachusetts | Women | | 56 | 47 | 68 | 84 |
| | | Men | | 43 | 39 | 49 | 76 |
| Mathematica 1994 [‡] | United States | Women | | 66 | 57 | 63 | 94 |
| | | Men | | 52 | 45 | 47 | 81 |

*Technical Report on Analytic Methods and Approaches Used in the 1993 California Tobacco Survey Analysis (Pierce et al. 1994a).

[†]1993 Massachusetts Tobacco Survey—Tobacco Use and Attitudes at the Start of the Massachusetts Control Program (Biener et al. 1994).

[‡]The Robert Wood Johnson Foundation Youth Access Survey, December 1994 (Strouse and Hall 1994).

aimed at girls and boys found no gender-specific differences in the proportion of respondents who would support tombstone advertising or a ban on “masked” tobacco promotions such as sportswear or event sponsorships. A 1993 poll (Gallup Organization 1993) found negligible differences between women and men in the proportions who thought that tobacco advertising was designed to appeal to children (75 vs. 78 percent), make smoking seem glamorous (65 vs. 63 percent), or encourage young people to smoke (69 vs. 63 percent).

Effects of Restrictions on Tobacco Advertising and Marketing

In recent years, many countries have imposed strict restrictions or bans on tobacco advertising and marketing (Mahood 1990; Mackay and Hedley 1997; Fraser 1998; Seffrin 1998; Watts 1998). In the United States, the attorneys-general settlement with the tobacco industry imposed substantial restrictions on advertising and marketing of tobacco products (Wilson 1999). Little information is available about the effects of these policies on smoking onset or smoking cessation. Laugesen and Meads (1991) analyzed 1960–

1986 data from 22 countries of the Organisation for Economic Co-operation and Development and found that the severity of tobacco restrictions was associated with lower tobacco consumption. On the basis of the data they examined, the authors concluded that an increase in price and a ban in tobacco promotion would have resulted in a 40-percent reduction in tobacco consumption among adults in 1986. In a study that examined risk factors for smoking (including knowledge and attitudes about smoking, smoking status of family members, self-confidence, and exposure to tobacco advertising) in Hong Kong, Lam and colleagues (1998) found that tobacco advertising had the strongest association with smoking status (RR, 2.68; 95 percent CI, 2.33 to 3.07).

In a review of the effects of tobacco advertising bans, Willemsen and De Zwart (1999) concluded that advertising bans lead not only to decreased tobacco consumption among adults but also to reductions in onset among adolescents. To date, information has not been published on the effects of advertising restrictions among women compared with men. (See also “Bans and Restrictions on Tobacco Advertising and Promotion” in Chapter 4.)

Smoking Prevention

Research on the prevention of smoking has been extensive over the past 20 years. Few of the prevention studies have stratified by gender; however, where they have, the results have been conflicting. In school-based programs, at least one study found an effect among girls compared with boys in the same program (Graham et al. 1990), and two others found effects among boys compared with girls in the same program (Klepp et al. 1993; Davis et al. 1995). Non-school-based interventions also have had mixed results that showed no gender differences (Pentz et al. 1989a,b) or an effect among girls compared with boys (Kelder et al. 1995). A mass-media intervention targeted to girls was successful in reducing smoking prevalence among girls (Flynn et al. 1995; Worden et al. 1996). Overall, it is unclear why some programs appeal to girls and others to boys. Additional research is needed.

Current Status of Prevention Research

The extant literature on gender-specific factors associated with initiation of cigarette use is reviewed elsewhere in this report (see “Factors Influencing Initiation of Smoking” in Chapter 4). Most reviews of studies of smoking prevention programs have not focused on assessing the effects of programs for adolescent females, but rather have attempted to determine the overall effectiveness of the programs and to identify key successful components of the programs (Rundall and Bruvold 1988; Glynn 1989; Bruvold 1993; Rooney and Murray 1996). Little systematic effort has been made to develop and evaluate preventive interventions specifically for girls.

School-Based Interventions

Most intervention studies with adolescents have taken place in schools, which afford easy access to adolescent peer groups. School-based programs offer

the opportunity to expose almost all children to the program and to evaluate the program's effects by assessing students over time. The impetus for these programs has been largely external to school systems and driven by federally funded research (Lynch and Bonnie 1994). Studies have focused on demonstrating the effectiveness of a program to reduce both initiation of tobacco use (primary prevention) and movement from experimental to regular use (secondary or tertiary prevention).

Several well-known projects did not report on gender-specific effects. These projects include the Life Skills Training Project (Botvin et al. 1990, 1995), the Midwestern Prevention Project (Pentz et al. 1989a,b), the Minnesota Smoking Prevention Program (Murray et al. 1987, 1988, 1989), Project ALERT (Ellickson et al. 1993), Project SHOUT (Elder et al. 1993), Project Towards No Tobacco Use (Sussman et al. 1993), and the Waterloo Smoking Prevention Project (Flay et al. 1985, 1989).

Graham and colleagues (1990) reported one-year follow-up results of Project SMART, which was designed to evaluate the effects of two programs based on social psychology. The study involved three seventh-grade cohorts (5,070 students) in the 1982–1983, 1983–1984, and 1984–1985 school years. Results were examined for six subgroups: male, female, white, African American, Hispanic, and Asian. The program was significantly effective in reducing cigarette smoking among girls ($p < 0.0001$) but not among boys.

The Oslo (Norway) Youth Study Smoking Prevention Program (Klepp et al. 1993) provided a 10-session smoking prevention program to students in fifth through seventh grades who were enrolled in Oslo schools in 1979 and 1980. The program, which was partly led by older students, encompassed education about the social, political, and health aspects of smoking; skill building to resist social pressures to smoke; and public commitment to remaining nonsmokers. The study included 1,013 students. The 10-year follow-up revealed significant effects of intervention among boys who had never smoked at baseline: 41.6 percent of the boys in the intervention group and 55.8 percent of the boys in the control group had ever smoked since baseline. No intervention effects were found among girls who had never smoked at baseline or among students of either gender who had experimented with smoking or who had smoked regularly (at least once a week) at baseline.

Gilchrist and colleagues (1989) reported on the combined results of two school-based interventions that emphasized skill building and were delivered by

health educators in 10 sessions to 1,281 sixth graders in western Washington state between 1981 and 1984. The outcome measure was weekly smoking at the 24-month follow-up. Baseline risk for smoking was determined by previous smoking experience or by intention to smoke in the near future; girls and boys were classified as being at high or low risk. The intervention had a positive effect on each of the four risk-by-gender groups but was least effective among girls at high risk for smoking. Gilchrist and colleagues observed that the “developmental and social dynamics that propel female adolescents into smoking may differ from those operating on young males” (Gilchrist et al. 1989, p. 241). Their conclusions were somewhat at variance with the results of Project SMART discussed above, which was designed to develop social skills for refusing drug use; that program significantly reduced cigarette smoking among girls but not boys (Graham et al. 1990).

In the Southwest Cardiovascular Curriculum Project (Davis et al. 1995), tobacco use prevention was one of five components of a 13-week curriculum taught to Navajo and Pueblo fifth graders at rural elementary schools in New Mexico. Baseline questionnaires were completed by 2,018 students. Follow-up questionnaires that were administered within 3 weeks of the end of the curriculum were completed by 1,766 students (1,352 who had received the curriculum and 414 control students). Students were asked whether they had changed the amount of tobacco they smoked or chewed since baseline. Boys who participated in the curriculum were significantly more likely than those in the control group to report reducing the amount of tobacco they used (41.2 vs. 22.0 percent). The difference was not significant among girls (25.2 vs. 23.2 percent). Long-term effects of the curriculum cannot be determined from this study.

Community-Based Interventions

Several research programs have supplemented school-based programs with broader community efforts to create an environment that discourages smoking initiation. Such community efforts typically include media components and may also include community organization to support nonsmoking, greater enforcement of laws restricting access of minors to tobacco products, and efforts to educate adults. The North Karelia Youth Project relied on mass media in conjunction with a school-based program geared to dissuade youth from smoking. Vartiainen and associates (1990) found a preventive effect

8 years after the program ended, but at 15 years after intervention, differences between intervention and control schools were no longer statistically significant (Vartiainen et al. 1998). The preventive effect was more pronounced among young men (27 percent) than among young women (24 percent). However, the interaction between study arm and gender was not statistically significant.

A comprehensive community-based smoking prevention program, the Midwestern Prevention Project (Pentz et al. 1989a,b), randomized eight schools in Kansas City to receive an intervention program or a control program. The intervention program provided students with skills to resist social pressures to use tobacco and provided models intended to support the non-use of tobacco. Within all eight schools, a longitudinal sample of sixth- and seventh-grade students was followed for two years. At the end of six months, the prevalence of smoking was significantly lower in the intervention schools than in the control schools for lifetime smoking, smoking in the past month, and smoking in the past week. At the end of two years, a significant difference only in lifetime smoking was found between intervention and control schools. Significant program effects were noted within grade and racial categories, but not by gender.

A smoking prevention component of the Minnesota Heart Health Program (Perry et al. 1992; Kelder et al. 1995) was delivered to 7th-grade students. This six-session program relied on peer leaders to transmit new information, norms, and skills to their fellow students. Each year through 12th grade, students who had been assessed at baseline (6th grade) were reassessed for change in smoking status by self-report (never smoked, experimental smoker, former smoker, or weekly smoker). They were compared with a control cohort in a reference community, also in Minnesota. The survey of 12th graders included 45 percent of the original cohort of 2,401 6th graders. Cross-sectional analysis included all students who participated in each survey. Throughout the follow-up period, smoking rates were significantly lower among the intervention students than among the control cohort ($p < 0.04$ for grades 7 through 12). When the data were stratified by gender, the intervention effects were somewhat stronger among girls. The differences in smoking rates were significant in grades 7 through 11 among girls. Among boys the differences were significant in grades 7, 8, and 10; marginally significant in grades 9 and 12 ($p = 0.06$); and non-significant in grade 11. The authors hypothesized that

“girls may be more receptive than boys to social influences models of health education” (Kelder et al. 1995, p. 5-42).

An innovative mass-media intervention for smoking prevention (Flynn et al. 1995; Worden et al. 1996) targeted girls. Participants were fourth-through sixth-grade students in two pairs of communities, one pair in the northeast United States and one pair in Montana. Students in two communities (one from each pair) received a modest school-based intervention (three or four class periods per year over four years). In the other two communities, the school-based intervention was supplemented with a four-year media campaign using paid and donated advertising time on broadcast and cable television programs and on radio stations. The media spots were designed to appeal to high-risk girls and boys at three developmental levels (grades 5 and 6, pre-puberty; grades 7 and 8, puberty; and grades 9 and 10, adolescence). The researchers made a special effort to target high-risk girls when purchasing time in the media campaign, which resulted in more media spots targeting girls. Media spots were changed regularly to keep up with changing tastes and styles. The initial cohort of 5,458 students was surveyed annually for four years, then two years later to assess long-term impact. At each assessment point, students were asked the number of cigarettes they had smoked in the past week. Although saliva samples were not analyzed, they were collected from all students in an attempt to increase the accuracy of self-reports.

In grades 8 through 10, the weekly smoking prevalence was 40 percent lower among girls who had received the media-plus-school intervention than among girls who had received the school-only intervention. The difference in smoking prevalence persisted two years later when the students were surveyed in grades 10 through 12: 15.6 percent of girls in communities with the media-plus-school intervention but 29.4 percent in communities with the school-only intervention smoked weekly. Girls receiving the media-plus-school intervention also had lower increases in beliefs in the advantages of smoking, positive attitudes toward smoking, perceptions of peer smoking, and intentions to smoke. The differences in weekly smoking were not significant among boys.

Public Health Initiatives

Few tobacco prevention programs or strategies, particularly those developed around sports and athletics, are designed specifically for girls. Although

most tobacco prevention sports strategies appear gender neutral, they historically emphasize male-dominated sports such as baseball or football. This historic bias changed in 1996 with the introduction in the United States of the SmokeFree Kids & Soccer Campaign, a tobacco prevention strategy targeted to adolescent girls. This program is unique for its emphasis on the sport of soccer and, more significantly, for its emphasis on an increasingly popular women's sport in the United States and throughout the world.

Through a public health partnership between the U.S. Women's National Soccer team, CDC, and NCI, SmokeFree Kids & Soccer encourages girls to participate in soccer to maintain fitness, make friends, have fun, and resist the pressure to smoke. In appearances at local schools, youth soccer tournaments, and media interviews, members of the U.S. Women's National Soccer team underscore the negative effect of tobacco use on athletic performance and promote participation in soccer as an alternative to smoking. Donna Shalala, then USDHHS Secretary, launched the campaign in advance of the 1996 Olympics in Atlanta by saying,

This campaign communicates not only the negative effects of tobacco use on athletic performance, but also promotes participation in sports as a positive alternative to smoking. [The campaign] is an excellent vehicle for reaching young people with the smoke-free message. Athletics give young people the very benefits they often seek from smoking: independence, status with their peers, a chance to make friends and a positive sense of self (Forbes 1996, p. 105).

The campaign also uses health sponsorship, a strategy that has been commonly used by commercial sponsors, including tobacco companies (Corti et al. 1997). By participating in physically strenuous sports like soccer, adolescent girls can reduce their risk of smoking while enhancing self-esteem and helping to

broaden community support for a smoke-free society (USDHHS 1997). Work by the Canadian Association for the Advancement of Women and Sport and Physical Activity has underscored the important physical and emotional benefits that being part of an athletic team can play in reducing an adolescent girl's risk for smoking (Canadian Association for the Advancement of Women and Sport and Physical Activity 2001).

In the first year, Smoke-Free Kids & Soccer was introduced to more than one million children and adults through a combination of television, radio, posters, public events, and an interactive Web site (<http://www.smokefree.gov>). One of the most prominent components of the program was a series of six posters of the U.S. Women's National Soccer team, which were produced and distributed nationwide from 1996 through 2000 to hundreds of thousands of fans, both girls and boys. The posters encouraged girls to participate in soccer and to make "Smoke-Free" an integral part of their personal lifestyle. Messages such as "You don't get to be a champion by taking cigarette breaks," "Keep your engine running clean," "Smoke a defender... not a cigarette," and "My only addiction is the game" resonate with children and the adults who care about them. Program messages were promoted widely during the 1999 Women's World Cup in the United States, and through grants to state health departments for community-based health promotion activities.

At the 11th World Conference on Tobacco OR Health in August 2000, USDHHS and the World Health Organization joined the Federation Internationale de Football Association, the international governing body of soccer, to announce an international SmokeFree Soccer campaign to discourage tobacco use and to promote smoke-free and physically active lifestyles worldwide (11th World Conference on Tobacco OR Health 2000). Australian Health Minister Michael Wooldridge committed soccer players in his country to the initiative, saying it would be helpful in "promoting the benefits of being smoke-free" (Commonwealth of Australia 2000).

Tobacco Control Advocacy Programs by and for Women

Apart from women's health groups and a handful of women's and girls' organizations, the tobacco control movement has not had great success

involving women's organizations in women's tobacco control. Although women play important roles in the tobacco control movement, few have held top

leadership positions (Mackay 1990; McLellan 1990; Greaves 1996). The public commitments made by the leaders of women's organizations from around the world at the 1999 Kobe Conference suggested that they are willing to play an important role in tobacco control advocacy (World Health Organization 1999a). New ways of working with women's groups are needed, such as having traditional tobacco control agencies show support for women and for women's issues broader than just smoking (Greaves 1996).

Historically, women's organizations that take on tobacco control have been oriented to education of their constituencies; however, some groups have mobilized themselves for action (e.g., flight attendant associations to ban smoking on airplane flights). Activities directed toward reducing advertising to women, as in magazines, have largely been unsuccessful. Similarly, countering tobacco sponsorship of women's sports events has been somewhat unsuccessful.

Education and Mobilization

Efforts to Raise Awareness and Encourage Action

For many women's and girls' organizations, educating their constituencies about how tobacco affects their lives is the first step to involvement in women's tobacco control. As a result of such education, women and girls may be motivated to participate in further activities to reduce tobacco use among women and girls. Education and mobilization activities vary but generally emphasize health-related issues, prevention of smoking, countering tobacco industry advertising targeted at women, financial sponsorship of women's groups, and legislation.

Girls' Organizations

Because most girls start smoking in early adolescence (see "Cigarette Smoking Among Girls" and "Smoking Initiation" in Chapter 2), many girls' organizations involved in tobacco control focus on prevention programs. The Girl Scouts of the USA has publications and programs that teach girls about the hazards of tobacco use and targeted tobacco advertising, as well as how to avoid tobacco use (Simpkins 1985; Eubanks 1992; Eubanks et al. 1995; Girl Scouts of the USA 1995). "Girl Scouts Against Smoking" includes antismoking patches and age-appropriate booklets containing information, activities, and resources (Girl Scouts of the USA 1996).

Girls Incorporated of Alameda County, California, designed the Jasira Warriors program to educate

young African American girls about the tobacco industry's influence in their communities (Girls Incorporated of Alameda County 1995). The program was designed to empower the girls by building their self-esteem and decision-making skills through education on tobacco use.

Women's Organizations

Health organizations have led the way in health and prevention efforts related to tobacco use by women. The Strategic Coalition of Girls and Women United Against Tobacco, of the American Medical Women's Association (AMWA), is dedicated to reducing tobacco-related death and disease among women (Strategic Coalition of Girls and Women United Against Tobacco 1995). Organizations that participate in the coalition receive mailings on tobacco-related issues and are encouraged to involve their members in tobacco control efforts.

The Task Force on Women & Girls, Tobacco & Lung Cancer, of the American College of Chest Physicians (ACCP), has developed a comprehensive speaker's kit entitled Women and Girls, Tobacco and Cancer. The kit includes slides with extensive speaker notes as well as resource lists and materials (e.g., articles, brochures). For professional audiences, the goal of the materials is to inform colleagues (e.g., physicians, nurses, pulmonary rehabilitation specialists, and health educators) who can influence others and effect change. A section on public policy also is included for influencing legislators and the media (ACCP Task Force 1998).

Among other organizations dedicated to the health and well-being of women and girls and that have policies or programs on women and tobacco issues are the American College of Obstetricians and Gynecologists (American College of Obstetricians and Gynecologists 1990), ACCP (ACCP Task Force 1998), the American Nurses Association (American Nurses Association 1995), the Minnesota Nursing Network for Tobacco Control (American Cancer Society 1994), the National Organization for Women (NOW 1991), the National Organization of School Nurses (Grande et al. 1995), the American Indian Women's Health Education Resource Center (Christine David, unpublished data), the Swedish Nurses Against Tobacco (Swedish Nurses Against Tobacco 1994), the Young Women's Christian Association (Grande et al. 1995), and the National Association for Public Health Policy (National Association for Public Health Policy 1996). The policies of most of these organizations focus on the health effects of tobacco use and the

education of members, and some include prevention messages or call attention to the targeting of women and girls by the tobacco industry (Grande et al. 1995).

Other Organized Efforts

A successful example of women mobilizing for tobacco control was the passage in October 1989 of landmark legislation to ban smoking on domestic airline flights of six hours or fewer (Morgan 1989). The most numerous voices in favor of this legislation came from various flight attendant associations, whose memberships were predominantly women. The Association of Professional Flight Attendants, the Flight Attendant Non-Smokers, the Association of Flight Attendants, AFL-CIO, and the National Association of Flight Attendants mobilized 100,000 flight attendants to support the legislation (Congressional Record 1989a,b). Flight attendants were concerned about adverse health effects, including lung cancer, resulting from their exposure to tobacco smoke in airline cabins.

The Office on Smoking and Health at CDC funds several organizations to work specifically on issues related to tobacco use among women. These organizations include AMWA, the International Network of Women Against Tobacco (INWAT), NOW, the National Association of African Americans for Positive Imagery, and the Northwest Portland Area Indian Health Board; all of these organizations include issues related to tobacco use among women in some of their activities (CDC 1998a,b).

The Maternal and Child Health Bureau of the Health Resources and Services Administration (HRSA) has worked with multiple states (Alaska, Delaware, Florida, Louisiana, Maryland, Massachusetts, Minnesota, Missouri, Montana, Nebraska, Nevada, New York, North Carolina, Ohio, South Dakota, Washington, West Virginia, and Wisconsin) and the District of Columbia, Puerto Rico, and Guam to incorporate performance measures on reducing cigarette smoking during pregnancy into the Title V, Maternal and Child Health Block Grant programs. Through this interstate network of performance measures, HRSA's Maternal and Child Health Bureau will be monitoring health care providers as they implement smoking cessation interventions for pregnant women. Details about this effort are available on their Web site at <http://www.mchdata.net>. Additionally, the HRSA-funded Healthy Start programs include smoking cessation for pregnant women as a major component of the initiative to reduce infant mortality.

The National Smoking Cessation Campaign for African American Women reached out to African American women's organizations and individuals to educate them about smoking cessation, to prevent nonsmokers from starting to smoke, and to advocate for smoke-free environments and divestiture from sponsorship by the tobacco industry (Morse Enterprises 1992). This focus transcended most smoking cessation programs by promoting changes in public policy that could reduce the environmental exposure to tobacco among African American women.

Some women's tobacco control groups have conducted qualitative research on what tobacco use and exposure means to women. INWAT commissioned some of its members to interview women around the world about how tobacco growing, manufacturing, and consumption affect women and girls (Greaves et al. 1994). Interviews were conducted in Brazil, Estonia, India, Indonesia, Japan, New Zealand, Northern Ireland, Spain, Tanzania, and the United States (Kentucky) (*World Smoking and Health* 1994). Beside health concerns, tobacco use and exposure were found to have significant economic, social, environmental, and cultural implications for the lives of women and girls. INWAT compiled the stories and published them in an edition of *World Smoking and Health* entitled "Herstories" (*World Smoking and Health* 1994). INWAT's goals were to encourage the global tobacco control movement to listen and react to the multifaceted aspects of how tobacco affects women's lives, and to inspire new approaches to tobacco control among women and girls (Greaves et al. 1994).

In 1994, the Commission for a Healthy New York established a special task force on women and tobacco to investigate the "tobacco problem from a woman's perspective and [develop] women-centered responses to it" (Commission for a Healthy New York 1995, p. 2). The task force found that few researchers had actually talked with women, either smokers or nonsmokers, about tobacco issues (Commission for a Healthy New York 1995). The task force conducted 30 roundtable discussions to learn why women and girls smoke and what they think of cigarette marketing campaigns. This qualitative research study, *Women Talk to Women About Smoking*, found that women still need to be educated on the deleterious effects of tobacco use and exposure on their lives. The women and girls interviewed linked gender-related factors such as low self-esteem, the stress of multiple roles, concern with body image, and social isolation to tobacco use among women and girls.

Activities to Counter Tobacco Advertising and Sponsorship

Many of the campaigns that have been conducted on issues related to tobacco use among women have focused on the targeting of women by tobacco companies' advertising and sponsorship (see "Influence of Tobacco Marketing on Smoking Initiation by Females" in Chapter 4). Organizations have conducted counteradvertising and mass-media campaigns, attempted to persuade women's magazines to refrain from accepting tobacco ads, encouraged women's sporting groups to reject funding from the tobacco industry, and lobbied for clean air legislation.

Counteradvertising and Mass-Media Campaigns

The Women vs. Smoking Network, a project funded by NCI and based at the Advocacy Institute in Washington, D.C., involved women's organizations, leaders, and publications in tobacco control efforts, especially efforts against tobacco advertising and promotion that target women (Women vs. Smoking Network 1990). The network catapulted the issue of targeted marketing to the national consciousness by strategically calling attention to the "Dakota Papers" (see text box 2 in "Contemporary Cigarette Advertisements and Promotions" in Chapter 4). These documents, sent anonymously to the network, contained a marketing strategy aimed at the "virile" female, described as a white female 18 through 20 years of age with no more than a high school education and minimal career opportunities and aspirations (Butler 1990). The network granted exclusive stories to certain television networks and newspapers, its members appeared on television with the Secretary of Health and Human Services, and it petitioned R.J. Reynolds to cease marketing the Dakota brand cigarette. As a result of strategies used by the network, the marketing plan for Dakota was changed and had limited test markets (Butler 1990). Unable to market Dakota under the original plan that called for targeting women with low educational levels, R.J. Reynolds ultimately pulled Dakota off the market because of low sales (*American Medical News* 1992).

Women And Girls Against Tobacco (WAGAT), which was funded by the California Department of Health Services, used the issue of advertising targeted to women and girls to educate and mobilize them (WAGAT 1993). One way WAGAT raised awareness was through purchasing kiosk space in shopping malls that attracted high concentrations of young people. The kiosks featured counterads on the tobacco

industry's targeting of women as well as educational information (Regina Penna, Director, WAGAT, memorandum to WAGAT Advisory Board, May 6, 1994).

During the summer of 1998, NOW promoted the "We Have Come a Long Way, So Don't Call Me Baby" campaign at 58 Lilith Fair concerts. T-shirts, postcards, and a display were created to disseminate information about women and tobacco at these women-oriented concerts. Additionally, in September 1998, 1,000 new volunteers promoted the "Love Your Body Day" campaign. This campaign raised awareness about how the tobacco industry manipulates women into using tobacco by playing with popular notions of body image (CDC 1998b).

Women's Magazine Projects

One of the major ways tobacco companies try to reach women is through women's magazines (Amos and Bostock 1992). Research has shown that women's magazines that accept tobacco advertising are significantly less likely to publish articles critical of women and smoking than are magazines that do not accept such ads (Warner et al. 1992) (see "Press Self-Censorship in Relation to Cigarette Advertising" in Chapter 4). The American Public Health Association conducted one of the first campaigns to uncover and attempt to change advertising policies of women's magazines (Johnson 1987). It requested that editors and publishers of 21 popular women's magazines include articles on the health hazards of smoking and wean their publications from tobacco industry advertising accounts. More than 50 women's, girls', and health organizations participated in the campaign. Eleven magazines responded, but none committed to change their advertising policy. Generally, the editors responded that the choice to run tobacco ads was based on the revenues received from the ad and that adult readers have the "freedom to choose" whether to buy a product (Johnson 1987).

As a result of a survey of cigarette advertising and health coverage in British women's magazines in 1984, the British government introduced voluntary advertising restrictions that prohibited magazines with a female readership of more than 200,000 and at least one-third of their readership aged 15 through 24 years from accepting cigarette ads (Action on Smoking and Health [ASH] Working Group on Women and Smoking 1990). A follow-up survey conducted by the ASH Working Group on Women and Smoking in 1989 documented whether the voluntary restrictions in Great Britain had affected cigarette advertising and health coverage in women's magazines. Coverage of

smoking and health issues remained largely unchanged between the two surveys (ASH Working Group on Women and Smoking 1990).

In California, WAGAT sponsored the "Golden Handcuffs Challenge" (1993) to reduce the quantity of tobacco ads in national magazines with a large proportion of women readers (Ferris 1994). WAGAT asked the editors of *Essence*, *Glamour*, and *People* to write articles on the effects of tobacco advertising on editorial practice. *Glamour* and *People* declined the request after six months, and *Essence* never responded (Ferris 1994). During this time, the California Department of Health Services tried to place a paid anti-smoking ad in *Essence*. Even though the ad was paid for, it was deemed "too controversial" and never appeared (Ferris 1994). As *Essence* editor Linda Villarosa stated in an article in the *Harvard Public Health Review*, "alienating a tobacco company means more than kissing off just cigarettes; it may mean alienating a conglomerate" (Villarosa 1991, p. 20). WAGAT's campaign was illuminating in that, even if the tobacco control movement had substantial funds to attempt to "buy out" tobacco ads in magazines, such efforts might be met with resistance.

The Australian National Women's Magazine Project was run by the Quit Victoria project of the Victorian Smoking and Health Program (1991–1992). The objective was to increase the amount and quality of reporting on the health effects of smoking by using paid "advertorials" in a number of popular young women's magazines (Davidson 1991). In the midst of the campaign, legislation to ban tobacco ads in the print media was enacted. The Quit Victoria project surveyed magazines for smoking-related articles six months before and after the ban went into effect. Coverage of the health effects of smoking appeared to increase after Quit Victoria started advertising (before the ad ban went into effect), but little difference in specific editorials was found before and after the ban itself. Quit Victoria noted that magazines contained more photographs of celebrities smoking after the ban than previously (Michelle Scollo, Executive Director, Victorian Smoking and Health Program, letter to Deborah McLellan, September 11, 1992).

The placement of images in women's magazines of models smoking may increase as countries pass advertising bans. For example, although Italy has a ban on tobacco advertising, an issue of an Italian *Vogue* contained numerous pages of models smoking in ads for non-tobacco products; a cover showcased a world-famous model, Linda Evangelista, smoking (Amos and Bostock 1992; Amos 1993). The Italian case

suggested that simply removing paid cigarette ads from magazines may not have the intended effect of entirely eliminating images of persons smoking or increasing coverage of issues related to smoking and health among women (Amos and Bostock 1992).

Countering Tobacco Sponsorship of Women's Tennis

For many years, starting in 1971, Philip Morris sponsored professional women's tennis (Robinson et al. 1992). Public figures who have expressed gratitude for the tobacco industry's sponsorship include Martina Navratilova, perhaps the best known woman tennis player in the world. The loyalty of women's tennis to its tobacco industry sponsor was so great that Proctor and Gamble's offer to support a women's tennis tournament was refused in 1988.

Many communities have held counterevents. Doctors Ought to Care organized a series of Emphysema Slims tennis tournaments as counterevents to the Virginia Slims tournaments (USDHHS 1991b). In 1990, the District of Columbia Interagency Council on Smoking and Health organized a media event to bring attention to the tobacco industry's sponsorship of the Virginia Slims tennis tournament. The event was held at The George Washington University, Washington, D.C. (District of Columbia Interagency Council on Smoking and Health 1990). The highlight of the event was a statement by Secretary of Health and Human Services Dr. Louis W. Sullivan, who urged the tobacco industry to end its sponsorship of sports events (Broder 1990).

The next year (1991), the Virginia Slims tennis tournament returned to Washington, D.C., where it was to be held at an amphitheater on property of the National Park Service. National and local organizations combined efforts to halt the tobacco industry's sponsorship of the tournament on public property. As a result of a lawsuit, local protests, and media attention, the National Park Service agreed to ban tobacco industry-sponsored tennis tournaments on its property (Spolar 1991). As of 1994, Virginia Slims no longer sponsored the major national women's tennis events, although individual events in several cities and the Tennis Legends Tour are still sponsored by Virginia Slims (IEG 1995).

In Australia, sports have not exhibited the same loyalty to the tobacco industry. The Victorian Health Promotion Foundation in Australia has used money raised by taxes on tobacco products to replace tobacco industry sponsorship of sports and arts organizations (Daube 1992; Galbally 1994). Australia's success

may reflect economics, because more than five times the budget necessary to replace tobacco sponsorship is available through the foundation (Daube 1992).

Women's Leadership Development and Training

Development of Women's Leadership in Tobacco Control

The desire for women to communicate and network on a global level was the foundation on which INWAT was built (McLellan 1990). Because one of the objectives of INWAT is to promote women's leadership in the tobacco control movement (INWAT 1994), it developed a training workshop that focused on tools for building such leadership: assessing knowledge, defining roles, enhancing skills, and building networks (McLellan et al. 1992). As a result of INWAT's efforts, the proportion of invited women speakers increased from 8 percent at the 1990 Seventh World Conference on Tobacco OR Health to 30 percent at the Eighth World Conference on Tobacco OR Health in 1992 (Jordan 1992; Gritz 1993). INWAT also succeeded in having world conferences adopt its resolutions on equity in representation and on funding for women at tobacco control conferences (*Tobacco Control* 1992).

INWAT has regional networks that focus on the needs of women in different parts of the world. The Latin American Women Association on Smoking Control (Associação de Mulheres da América Latina para o Controle do Tabagismo [AMALTA] 1994), the Canadian Network of Women Against Tobacco, INWAT-Europe, and WAGAT have been particularly active regional networks with funds committed to them (INWAT 1995). Other regional networks of INWAT exist in Africa, Asia, and Australia (INWAT 1999).

As a result of a resolution passed at the 1990 World Conference on Smoking and Health in Perth, Australia, the International Union Against Cancer organized the First International Conference on Women and Smoking, which took place in Northern Ireland in October 1992. This landmark event produced a series of recommendations that focused on raising awareness about women and tobacco, countering pressures on women to use tobacco, and organizing women for action in tobacco control (Health Promotion Agency of Northern Ireland and Ulster Cancer Foundation 1993).

In June 1994, the Women United Against Tobacco Workshop was convened by the American Public Health Association to develop a comprehensive

national plan to reduce women's use of and exposure to tobacco (McLellan and Wright 1996). The resultant national consensus document included a goal to increase the number and power of women leaders in tobacco control by convening a summit on women and tobacco, promoting women spokespersons, and encouraging women's leadership within tobacco control organizations.

Most recently, in November of 1999, the World Health Organization sponsored an International Conference on Tobacco and Health in Kobe, Japan. It was titled, "Making a Difference to Tobacco and Health: Avoiding the Tobacco Epidemic in Women and Youth." The conference was attended by several hundred leaders of women's organizations and of other governmental and nongovernmental organizations from around the world, as well as by the media, health scientists, and public health advocates. Formal presentations addressed the worldwide prevalence and effects on women's health of active smoking and of ETS exposure, the economic costs of tobacco use, the international marketing of tobacco products to women, and other topics. The resultant Kobe Declaration included a number of strong resolutions, such as a call for a global ban on tobacco advertising, funding for counteradvertising that disconnects women's liberation and tobacco use, and mobilization of many segments of society in the fight against tobacco use (World Health Organization 1999b).

Development of Tobacco Control Advocates in Women's Organizations

The California chapter of NOW launched the "Redefining Liberation" campaign to educate its members about issues related to tobacco use among women and to develop leadership on the subject within NOW's ranks (California NOW 1994). The California chapter used community-based strategies and developed an action guide and training videotape for its campaign to develop young leaders (Elizabeth Toledo, NOW, letter to Deborah McLellan, September 8, 1995). Early in 1998, the videotape was distributed to 40 states and every region throughout the United States (CDC 1998a).

The Strategic Coalition of Girls and Women United Against Tobacco, a project of AMWA with funding from CDC, also has trained leaders in women's organizations on tobacco control issues (AMWA 1995). In particular, AMWA trains women physicians and medical students in tobacco control and media advocacy to be spokespersons for tobacco control (AMWA 1995).

The Swedish National Institute of Public Health sponsors an innovative program with the Miss Sweden beauty pageant, requiring all Miss Sweden candidates since 1996 to be nonsmokers (Steimle 1999). The candidates are also required to work as tobacco educators in their local school districts for at least four to

six weeks. One of the purposes of the project is to provide Swedish girls with fashionable role models who do not smoke. By 1997, more than 30,000 students in grades four through six had met a Miss Sweden candidate. The project has been well received by the schools and the media.

Conclusions

1. Using evidence from studies that vary in design, sample characteristics, and intensity of the interventions studied, researchers to date have not found consistent gender-specific differences in the effectiveness of intervention programs for tobacco use. Some clinical studies have shown lower cessation rates among women than among men, but others have not. Many studies have not reported cessation results by gender.
2. Among women, biopsychosocial factors such as pregnancy, fear of weight gain, depression, and the need for social support appear to be associated with smoking maintenance, cessation, or relapse.
3. A higher percentage of women stop smoking during pregnancy, both spontaneously and with assistance, than at other times in their lives. Using pregnancy-specific programs can increase smoking cessation rates, which benefits infant health and is cost-effective. Only about one-third of women who stop smoking during pregnancy are still abstinent one year after the delivery.
4. Women fear weight gain during smoking cessation more than do men. However, few studies have found a relationship between weight concerns and smoking cessation among either women or men. Further, actual weight gain during cessation does not predict relapse to smoking.
5. Adolescent girls are more likely than adolescent boys to respond to smoking cessation programs that include social support from the family or their peer group.
6. Among persons who smoke heavily, women are more likely than men to report being dependent on cigarettes and to have lower expectations about stopping smoking, but it is not clear if such women are less likely to quit smoking.
7. Currently, no tobacco cessation method has proved to be any more or less successful among minority women than among white women in the same study, but research on smoking cessation among women of most racial and ethnic minorities has been scarce.
8. Women are more likely than men to affirm that they smoke less at work because of a worksite policy and are significantly more likely than men to attribute reduced amount of daily smoking to their worksite policy. Women also are more likely than men to support policies designed to prevent smoking initiation among adolescents, restrictions on youth access to tobacco products, and limits on tobacco advertising and promotion.
9. Successful interventions have been developed to prevent smoking among young people, but little systematic effort has been focused on developing and evaluating prevention interventions specifically for girls.

References

- 11th World Conference on Tobacco OR Health. FIFA joins world health leaders to give tobacco the boot! *SmokeFree Soccer* campaign goes global. Chicago: 11th World Conference on Tobacco OR Health, 2000 Aug 11.
- Abrams DB, Boutwell WB, Grizzle J, Heimendinger J, Sorensen G, Varnes J. Cancer control at the workplace: the Working Well Trial. *Preventive Medicine* 1994;23(1):15-27.
- Abramson JH, Gofin R, Hopp C, Gofin J, Donchin M, Habib J. Evaluation of a community program for the control of cardiovascular risk factors: the CHAD program in Jerusalem. *Israel Journal of Medical Sciences* 1981;17(2-3):201-12.
- Acitelli LK, Antonucci TC. Gender differences in the link between marital support and satisfaction in older couples. *Journal of Personality and Social Psychology* 1994;67(4):688-98.
- Action on Smoking and Health Working Group on Women and Smoking. *Smoke Still Gets in Her Eyes. A Report on Cigarette Advertising in British Women's Magazines*. Dewsbury (UK): Action on Smoking and Health, 1990.
- Ahijevych K, Wewers ME. Factors associated with nicotine dependence among African American women cigarette smokers. *Research in Nursing and Health* 1993;16(4):283-92.
- Ahluwalia JS, Resnicow K, Clark WS. Knowledge about smoking, reasons for smoking, and reasons for wishing to quit in inner-city African Americans. *Ethnicity and Disease* 1998;8(3):385-93.
- Albrecht SA, Rosella JD, Patrick T. Smoking among low-income, pregnant women: prevalence rates, cessation interventions, and clinical implications. *Birth* 1994;21(3):155-62.
- Allen SS, Hatsukami D, Christianson D, Nelson D. Symptomatology and energy intake during the menstrual cycle in smoking women. *Journal of Substance Abuse* 1996;8(3):303-19.
- Allen SS, Hatsukami D, Christianson D, Nelson D. Withdrawal and pre-menstrual symptomatology during the menstrual cycle in short-term smoking abstinence: effects of menstrual cycle on smoking abstinence. *Nicotine and Tobacco Research* 1999;1(2):129-42.
- Altman DG, Foster V, Rasenick-Douss L, Tye JB. Reducing the illegal sale of cigarettes to minors. *Journal of the American Medical Association* 1989; 261(1):80-3.
- Altman DG, Wheelis AY, McFarlane M, Lee H-R, Fortmann SP. The relationship between tobacco access and use among adolescents: a four community study. *Social Science and Medicine* 1999;48(6): 759-75.
- American Cancer Society. *Minnesota ASSIST: Nurses & Tobacco Control*. Minneapolis (MN): American Cancer Society, Minnesota Division, 1994.
- American College of Chest Physicians Task Force: Women, Tobacco and Lung Cancer. *Women & Girls, Tobacco and Cancer*. Innovations in Medical Education Consortium. Vancouver (Canada): American College of Chest Physicians, 1998.
- American College of Obstetricians and Gynecologists. Tobacco industry criticized for ads aimed at women [press release]. Washington: American College of Obstetricians and Gynecologists, 1990 Oct 3.
- American Medical News. No more Dakotas. *American Medical News* 1992 Apr 13:18.
- American Medical Women's Association. *Progress Report for the Year 01 of the Strategic Coalition of Girls and Women United Against Tobacco*. Alexandria (VA): American Medical Women's Association, 1995.
- American Nurses Association. Position statement on cessation of tobacco use. Washington: American Nurses Association, 1995.
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 3rd rev. ed. Washington: American Psychiatric Association, 1987.
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington: American Psychiatric Association, 1994.
- Amos A. How women are exploited by the tobacco industry. In: *First International Conference on Women and Smoking. Conference proceedings and recommendations for action; 1992 Oct 5-7; Newcastle (Northern Ireland)*. Health Promotion Agency of Northern Ireland and the Ulster Cancer Foundation, 1993:38-40.
- Amos A, Bostock Y. Policy on cigarette advertising and coverage of smoking and health in European women's magazines. *British Medical Journal* 1992; 304(6819):99-101.
- Anantha N, Nandakumar A, Vishwanath N, Venkatesh T, Pallad YG, Manjunath P, Kumar DR, Murthy SGS, Shivashankariah, Dayananda CS. Efficacy of an anti-tobacco community education program in India. *Cancer Causes and Control* 1995; 6(2):119-29.

- Andersch B, Milsom I. An epidemiologic study of young women with dysmenorrhea. *American Journal of Obstetrics and Gynecology* 1982;144(6): 655-60.
- Associação de Mulheres da América Latina para o Controle do Tabagismo (Latin American Women Association on Smoking Control). *AMALTA 1994: Activities Report*. Rio de Janeiro: Associação de Mulheres da América Latina para o Controle do Tabagismo, 1994.
- Associated Press. Antismoking bid by Clinton finds opposition in poll. *Boston Globe* 1995 Aug 23:3 (col 5).
- Atkinson AB, Skegg JL. Anti-smoking publicity and the demand for tobacco in the UK. *Manchester School of Economic and Social Studies* 1973;41(3): 265-82.
- Balch GI. Exploring perceptions of smoking cessation among high school smokers: input and feedback from focus groups. *Preventive Medicine* 1998;27(5 Pt 3):A55-A63.
- Baric L, MacArthur C, Sherwood M. A study of health education aspects of smoking in pregnancy. *International Journal of Health Education* 1976;19(Suppl 2):1-17.
- Baron JA, La Vecchia C, Levi F. The antiestrogenic effect of cigarette smoking in women. *American Journal of Obstetrics and Gynecology* 1990;162(2): 502-14.
- Barrett DH, Anda RF, Escobedo LG, Croft JB, Williamson DF, Marks JS. Trends in oral contraceptive use and cigarette smoking: Behavioral Risk Factor Surveillance System, 1982 and 1988. *Archives of Family Medicine* 1994;3(5):438-43.
- Batten L. Respecting sameness and difference: taking account of gender in research on smoking. *Tobacco Control* 1993;2(3):185-6.
- Belle D. Gender differences in the social moderators of stress. In: Barnett RC, Biener L, Baruch GK, editors. *Gender and Stress*. New York: Free Press, 1987: 257-77.
- Benowitz NL. Nicotine replacement therapy during pregnancy. *Journal of the American Medical Association* 1991;266(22):3174-7.
- Berman BA, Gritz ER. Women and smoking: current trends and issues for the 1990s. *Journal of Substance Abuse* 1991;3(2):221-38.
- Biener L. Gender differences in the use of substances for coping. In: Barnett RC, Biener L, Baruch GK, editors. *Gender and Stress*. New York: Free Press, 1987:330-49.
- Biener L, Abrams DB, Emmons K, Follick MJ. Evaluating worksite smoking policies: methodologic issues. *New York State Journal of Medicine* 1989a; 89(1):5-10.
- Biener L, Abrams DB, Follick MJ, Dean L. A comparative evaluation of a restrictive smoking policy in a general hospital. *American Journal of Public Health* 1989b;79(2):192-5.
- Biener L, Aseltine RH, Cohen B, Anderka M. Reactions of adult and teenaged smokers to the Massachusetts Tobacco Tax. *American Journal of Public Health* 1998;88(9):1389-91.
- Biener L, Fowler FJ, Roman AM. 1993 Massachusetts Tobacco Survey: *Tobacco Use and Attitudes at the Start of the Massachusetts Tobacco Control Program*. Boston: University of Massachusetts, Center for Survey Research, 1994.
- Bjornson W, Rand C, Connett JE, Lindgren P, Nides M, Pope F, Buist AS, Hoppe-Ryan C, O'Hara P. Gender differences in smoking cessation after 3 years in the Lung Health Study. *American Journal of Public Health* 1995;85(2):223-30.
- Black DR, Loftus EA, Chatterjee R, Tiffany S, Babrow AS. Smoking cessation interventions for university students: recruitment and program design considerations based on social marketing theory. *Preventive Medicine* 1993;22(3):388-99.
- Blake SM, Klepp K-I, Pechacek TF, Folsom AR, Luepker RV, Jacobs DR, Mittelmark MB. Differences in smoking cessation strategies between men and women. *Addictive Behaviors* 1989;14(4):409-18.
- Blechman EA. Competence, depression, and behavior modification with women. In: Hersen M, Eisler RM, Miller PM, editors. *Progress in Behavior Modification*. Vol. 12. New York: Academic Press, 1981: 227-63.
- Borland R, Chapman S, Owen N, Hill D. Effects of workplace smoking bans on cigarette consumption. *American Journal of Public Health* 1990;80(2): 178-80.
- Borland R, Owen N, Hill D, Chapman S. Staff members' acceptance of the introduction of workplace smoking bans in the Australian public service. *Medical Journal of Australia* 1989;151(9):525-8.
- Borland R, Owen N, Hill D, Schofield P. Predicting attempts and sustained cessation of smoking after the introduction of workplace smoking bans. *Health Psychology* 1991;10(5):336-42.
- Borland R, Pierce JP, Burns DM, Gilpin E, Johnson M, Bal D. Protection from environmental tobacco smoke in California: the case for a smoke-free

- workplace. *Journal of the American Medical Association* 1992;268(6):749–52.
- Botvin GJ, Baker E, Dusenbury L, Botvin EM, Diaz T. Long-term follow-up results of a randomized drug abuse prevention trial in a white middle-class population. *Journal of the American Medical Association* 1995;273(14):1106–12.
- Botvin GJ, Baker E, Dusenbury L, Tortu S, Botvin EM. Preventing adolescent drug abuse through a multimodal cognitive-behavioral approach: results of a 3-year study. *Journal of Consulting and Clinical Psychology* 1990;58(4):437–46.
- Boyd NR, Sutton C, Orleans CT, McClatchey MW, Binger R, Fleisher L, Heller D, Baum S, Graves C, Ward J. Quit Today! A targeted communications campaign to increase use of the cancer information service by African American smokers. *Preventive Medicine* 1998;27(5 Pt 2):S50–S60.
- Brayden RM, Christensen M. Smoking cessation counseling with low-income prenatal patients [letter]. *Southern Medical Journal* 1994;87(12):1288–9.
- Brenner H, Mielck A. Smoking prohibition in the workplace and smoking cessation in the Federal Republic of Germany. *Preventive Medicine* 1992;21(2):252–61.
- Brigham J, Gross J, Stitzer ML, Felch LJ. Effects of a restricted work-site smoking policy on employees who smoke. *American Journal of Public Health* 1994;84(5):773–8.
- Broder K. Sullivan criticizes company for courting smokers at tennis matches. *Journal of the National Cancer Institute* 1990;82(7):551–2.
- Brown S, Vessey M, Stratton I. The influence of method of contraception and cigarette smoking on menstrual patterns. *British Journal of Obstetrics and Gynaecology* 1988;95(9):905–10.
- Brownson RC, Jackson-Thompson J, Wilkerson JC, Davis JR, Owens NW, Fisher EB Jr. Demographic and socioeconomic differences in beliefs about the health effects of smoking. *American Journal of Public Health* 1992;82(1):99–103.
- Bruvold WH. A meta-analysis of adolescent smoking prevention programs. *American Journal of Public Health* 1993;83(6):872–80.
- Butler J. The “Dakota Papers.” Paper presented at the Women, Tobacco and Health pre-conference workshop at the Seventh World Conference on Tobacco and Health; 1990 Mar 30; Perth (Australia).
- Byrd JC, Meade CD. Smoking cessation among pregnant women in an urban setting. *Wisconsin Medical Journal* 1993;92(11):609–12.
- California NOW. The politics of women and smoking [fact sheet]. Sacramento (CA): California NOW, 1994.
- Canadian Association for the Advancement of Women and Sport and Physical Activity. Evening the Odds: Adolescent Women, Tobacco and Physical Activity; <<http://www.caaws.ca/Girls/eveningodds.htm>>; accessed: January 26, 2001.
- Carleton RA, Lasater TM, Assaf AR, Feldman HA, McKinlay S. The Pawtucket Heart Health Program: community changes in cardiovascular risk factors and projected disease risk. *American Journal of Public Health* 1995;85(6):777–85.
- Cavin SW, Pierce JP. Low-cost cigarettes and smoking behavior in California, 1990–1993. *American Journal of Preventive Medicine* 1996;12(1):17–21.
- Centers for Disease Control. Public attitudes regarding limits on public smoking and regulation of tobacco sales and advertising—10 U.S. communities, 1989. *Morbidity and Mortality Weekly Report* 1991;40(21):344–5,351–3.
- Centers for Disease Control and Prevention. Physician and other health-care professional counseling of smokers to quit—United States, 1991. *Morbidity and Mortality Weekly Report* 1993a;42(44):854–7.
- Centers for Disease Control and Prevention. Smoking cessation during previous year among adults—United States, 1990 and 1991. *Morbidity and Mortality Weekly Report* 1993b;42(26):504–7.
- Centers for Disease Control and Prevention. Indicators of nicotine addiction among women—United States, 1991–1992. *Morbidity and Mortality Weekly Report* 1995a;44(6):102–5.
- Centers for Disease Control and Prevention. Smokeless tobacco use among American Indian women—Southeastern North Carolina, 1991. *Morbidity and Mortality Weekly Report* 1995b;44(6):113–7.
- Centers for Disease Control and Prevention. Initiative by organizations: tobacco control activities for February, 1998 [progress report]. Atlanta: Centers for Disease Control and Prevention, Center for Health Promotion and Disease Prevention, Office on Smoking and Health, 1998a.
- Centers for Disease Control and Prevention. Monthly tobacco control activities for national organizations: May/June 1998 [progress report]. Atlanta: Centers for Disease Control and Prevention, Center for Health Promotion and Disease Prevention, Office on Smoking and Health, 1998b.
- Centers for Disease Control and Prevention. Response to increases in cigarette prices by race/ethnicity, income, and age groups—United States,

- 1976–1993. *Morbidity and Mortality Weekly Report* 1998c;47(29):605–9.
- Centers for Disease Control and Prevention. Decline in cigarette consumption following implementation of a comprehensive tobacco prevention and education program—Oregon, 1996–1998. *Morbidity and Mortality Weekly Report* 1999;48(7):140–3.
- Cepeda-Benito A. Meta-analytical review of the efficacy of nicotine chewing gum in smoking treatment programs. *Journal of Consulting and Clinical Psychology* 1993;61(5):822–30.
- Chaloupka F. Clean indoor air laws, addiction and cigarette smoking. *Applied Economics* 1992;24(2):193–205.
- Chaloupka FJ. *Men, women, and addiction: the case of cigarette smoking*. Working paper no. 3267. Cambridge (MA): National Bureau of Economic Research, 1990.
- Chaloupka FJ, Pacula RL. *An examination of gender and race differences in youth smoking: responsiveness to price and tobacco control policies*. Working paper no. 6541. Cambridge (MA): National Bureau of Economic Research, 1998.
- Chaloupka FJ, Wechsler H. *Price, tobacco control policies and smoking among young adults*. Working paper no. 5012. Cambridge (MA): National Bureau of Economic Research, 1995.
- Charlton A, While D. Smoking and menstrual problems in 16-year-olds. *Journal of the Royal Society of Medicine* 1996;89(4):1935.
- Chesney MA. Women, work-related stress, and smoking. In: Frankenhaeuser M, Lundberg U, Chesney M, editors. *Women, Work, and Health: Stress and Opportunities*. New York: Plenum Press, 1991:139–55.
- Clarke V, White V, Beckwith J, Borland R, Hill D. Are attitudes towards smoking different for males and females? *Tobacco Control* 1993;2(3):201–8.
- Cnattingius S, Lindmark G, Meirik O. Who continues to smoke while pregnant? *Journal of Epidemiology and Community Health* 1992;46(3):218–21.
- Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *Journal of Health and Social Behavior* 1983;24(4):385–96.
- Cohen S, Lichtenstein E. Partner behaviors that support quitting smoking. *Journal of Consulting and Clinical Psychology* 1990;58(3):304–9.
- Cohen S, Lichtenstein E, Prochaska JO, Rossi JS, Gritz ER, Carr CR, Orleans CT, Schoenbach VJ, Biener L, Abrams D, DiClemente C, Curry S, Marlatt GA, Cummings KM, Emont SL, Giovino G, Ossip-Klein D. Debunking myths about self-quitting: evidence from 10 prospective studies of persons who attempt to quit smoking by themselves. *American Psychologist* 1989;44(11):1355–65.
- Commission for a Healthy New York. *Women Talk to Women about Smoking: A Report of the Women and Tobacco Task Force*. Albany (NY): Commission for a Healthy New York, 1995.
- COMMIT Research Group. Community Intervention Trial for Smoking Cessation (COMMIT): summary of design and intervention. *Journal of the National Cancer Institute* 1991;83(22):1620–8.
- COMMIT Research Group. Community Intervention Trial for Smoking Cessation (COMMIT): I. Cohort results from a four-year community intervention. *American Journal of Public Health* 1995a;85(2):183–92.
- COMMIT Research Group. Community Intervention Trial for Smoking Cessation (COMMIT): II. Changes in adult cigarette smoking prevalence. *American Journal of Public Health* 1995b;85(2):193–200.
- Commonwealth of Australia. Australia's women soccer team to send global anti-tobacco message [media release]. Canberra City (Australia): Commonwealth of Australia, Commonwealth Department of Health and Aged Care, 2000 Aug 13.
- Commonwealth of Massachusetts. *Report on the Sale of Tobacco to Minors in Massachusetts*. Boston: Commonwealth of Massachusetts, Office of the Attorney General, 1994.
- Congressional Record*. Association of Professional Flight Attendants support for legislation to ban smoking on domestic flights [letter]. *Congressional Record*, 101st Congress, 1st session. 1989a;135 (Pt 14):20006.
- Congressional Record*. Flight Attendant Non-Smokers support for legislation to ban smoking on domestic airline flights [letter]. *Congressional Record*, 101st Congress, 1st session. 1989b;135(Pt 14):20005–6.
- Connolly HM, Crary JL, McGoon MD, Hensrud DD, Edwards BS, Edwards WD, Schaff HV. Valvular heart disease associated with fenfluramine-phentermine. *New England Journal of Medicine* 1997;337(9):581–8.
- Coppotelli HC, Orleans CT. Partner support and other determinants of smoking cessation maintenance among women. *Journal of Consulting and Clinical Psychology* 1985;53(4):455–60.
- Cormier J, Herbig LJ, DiLorenzo TM, Frensch P, Fisher EB Jr. Effects of social support, perceived competence, and partner smoking status in successful

- smoking quit attempts. Paper presented at the Association for Advancement of Behavior Therapy; 1990 Nov; San Francisco.
- Corti B, Donovan RJ, Holman CDJ, Coten N, Jones SJ. Using sponsorship to promote health messages to children. *Health Education and Behavior* 1997;24(3):276-86.
- Covey LS, Glassman AH, Stetner F. Depression and depressive symptoms in smoking cessation. *Comprehensive Psychiatry* 1990;31(4):350-4.
- Covey LS, Zang EA, Wynder EL. Cigarette smoking and occupational status: 1977 to 1990. *American Journal of Public Health* 1992;82(9):1230-4.
- Craig D, Parrott A, Coomber J-A. Smoking cessation in women: effects of the menstrual cycle. *International Journal of the Addictions* 1992;27(6):697-706.
- Crittenden KS, Manfredi C, Lacey L, Warnecke R, Parsons J. Measuring readiness and motivation to quit smoking among women in public health clinics. *Addictive Behaviors* 1994;19(5):497-507.
- Cummings KM, Sciandra R, Davis S, Rimer B. Response to anti-smoking campaign aimed at mothers with young children. *Health Education Research* 1989;4(4):429-37.
- Curry SJ. Self-help interventions for smoking cessation. *Journal of Consulting and Clinical Psychology* 1993;61(5):790-803.
- Curry S, Wagner EH, Grothaus LC. Intrinsic and extrinsic motivation for smoking cessation. *Journal of Consulting and Clinical Psychology* 1990;58(3):310-6.
- Curry SJ, Marlatt GA, Gordon J, Baer JS. A comparison of alternative theoretical approaches to smoking cessation and relapse. *Health Psychology* 1988;7(6):545-56.
- Dalack GW, Glassman AH, Rivelli S, Covey L, Stetner F. Mood, major depression and fluoxetine response in cigarette smokers. *American Journal of Psychiatry* 1995;152(3):398-403.
- Dale LC, Olsen DA, Patten CA, Schroeder DR, Croghan IT, Hurt RD, Offord KP, Wolter TD. Predictors of smoking cessation among elderly smokers treated for nicotine dependence. *Tobacco Control* 1997;6(3):181-7.
- Dale LC, Schroeder DR, Wolter TD, Croghan IT, Hurt RD, Offord KP. Weight change after smoking cessation using variable doses of transdermal nicotine replacement. *Journal of General Internal Medicine* 1998;13(1):9-15.
- Daube MM. Building on success: from Buenos Aires to Paris. *Tobacco Control* 1992;1(3):198-204.
- Davidson M. National Womens Magazine Project outline [project report]. Victoria (Australia): Quit Victoria, 1991.
- Davis MC, Matthews KA. Cigarette smoking and oral contraceptive use influence women's lipid, lipoprotein, and cardiovascular responses during stress. *Health Psychology* 1990;9(6):717-36.
- Davis SM, Lambert LC, Gomez Y, Skipper B. Southwest Cardiovascular Curriculum Project: study findings for American Indian elementary students. *Journal of Health Education* 1995;26(Suppl 2):S-72-S-81.
- Davis SW, Cummings KM, Rimer BK, Sciandra R, Stone JC. The impact of tailored self-help smoking cessation guides on young mothers. *Health Education Quarterly* 1992;19(4):495-504.
- DeBon M, Klesges RC, Klesges LM. Symptomatology across the menstrual cycle in smoking and non-smoking women. *Addictive Behaviors* 1995;20(3):335-43.
- DiFranza JR, Savageau JA, Aisquith BF. Youth access to tobacco: the effects of age, gender, vending machine locks, and "It's the Law" programs. *American Journal of Public Health* 1996;86(2):221-4.
- Dijkstra A, De Vries H, Roijackers J. Targeting smokers with low readiness to change with tailored and nontailored self-help materials. *Preventive Medicine* 1999;28(2):203-11.
- Dijkstra A, De Vries H, Roijackers J, van Breukelen G. Tailoring information to enhance quitting in smokers with low motivation to quit: three basic efficacy questions. *Health Psychology* 1998;17(6):513-9.
- DiLorenzo TM, Powers RW, Cormier JF, Herbig LJ, Fisher EB Jr. The role of social support and competence skills in smoking cessation among women. Paper presented at the 1990 World Conference on Lung Health, American Lung Association and International Union against Tuberculosis and Lung Disease; 1990 May; Boston.
- District of Columbia Interagency Council on Smoking and Health. Protest of the 1990 Virginia Slims Tennis Tournament: summary of activities [report]. Washington: District of Columbia Interagency Council on Smoking and Health, 1990.
- Doherty K, Militello FS, Kinnunen T, Garvey AJ. Nicotine gum dose and weight gain after smoking cessation. *Journal of Consulting and Clinical Psychology* 1996;64(4):799-807.
- Dolan-Mullen P, Ramirez G, Groff JY. A meta-analysis of randomized trials of prenatal smoking cessation interventions. *American Journal of Obstetrics and Gynecology* 1994;171(5):1328-34.

- Dwyer T, Pierce JP, Hannam CD, Burke N. Evaluation of the Sydney "Quit. For Life" anti-smoking campaign. Part 2. Changes in smoking prevalence. *Medical Journal of Australia* 1986;144(7):344-7.
- Eck LH, Kleges RC, Meyers AW, Slawson DL, Winders SA. Changes in food consumption and body weight associated with smoking cessation across menstrual cycle phase. *Addictive Behaviors* 1997;22(6):775-82.
- Edwards NB, Murphy JK, Downs AD, Ackerman BJ, Rosenthal TL. Doxepin as an adjunct to smoking cessation: a double-blind pilot study. *American Journal of Psychiatry* 1989;146(3):373-6.
- Egger G, Fitzgerald W, Frape G, Monaem A, Rubinstein P, Tyler C, McKay B. Results of large scale media antismoking campaign in Australia: North Coast "Quit for Life" programme. *British Medical Journal* 1983;287(6399):1125-8.
- Eissenberg T, Adams C, Riggins EC III, Likness M. Smokers' sex and the effects of tobacco cigarettes: subject-rated and physiological measures. *Nicotine and Tobacco Research* 1999;1(4):317-24.
- Elder JP, Wildey M, de Moor C, Sallis JF Jr, Eckhardt L, Edwards C, Erickson A, Golbeck A, Hovell M, Johnston D, Levitz MD, Molgaard C, Young R, Vito D, Woodruff SI. The long-term prevention of tobacco use among junior high school students: classroom and telephone interventions. *American Journal of Public Health* 1993;83(9):1239-44.
- Ellickson PL, Bell RM, Harrison ER. Changing adolescent propensities to use drugs: results from Project ALERT. *Health Education Quarterly* 1993;20(2):227-42.
- Emmons KM, Hammond SK, Abrams DB. Smoking at home: the impact of smoking cessation on nonsmokers' exposure to environmental tobacco smoke. *Health Psychology* 1994;13(6):516-20.
- Emmons KM, Weidner G. The effects of cognitive and physical stress on cardiovascular reactivity among smokers and oral contraceptive users. *Psychophysiology* 1988;25(2):166-71.
- Emont SL, Choi WS, Novotny TE, Giovino GA. Clean indoor air legislation, taxation, and smoking behaviour in the United States: an ecological analysis. *Tobacco Control* 1993;2(1):13-7.
- Emont SL, Cummings KM. Weight gain following smoking cessation: a possible role for nicotine replacement in weight management. *Addictive Behaviors* 1987;12(2):151-5.
- Endicott J, Halbreich U. Clinical significance of premenstrual dysphoric changes. *Journal of Clinical Psychiatry* 1988;49(12):486-9.
- Ernster VL. Women and smoking [editorial]. *American Journal of Public Health* 1993;83(9):1202-3.
- Ershoff DH, Aaronson NK, Danaher BG, Wasserman FW. Behavioral, health, and cost outcomes of an HMO-based prenatal health education program. *Public Health Reports* 1983;98(6):536-47.
- Ershoff DH, Mullen PD, Quinn VP. A randomized trial of a serialized self-help smoking cessation program for pregnant women in an HMO. *American Journal of Public Health* 1989;79(2):182-7.
- Ershoff DH, Quinn VP, Mullen PD, Lairson DR. Pregnancy and medical cost outcomes of a self-help prenatal smoking cessation program in a HMO. *Public Health Reports* 1990;105(4):340-7.
- Eubanks T. *Developing Health and Fitness: Be Your Best!* New York: Girl Scouts of the United States of America, 1992.
- Eubanks T, Mosatche HS, Cryan R, Bergerson C. *Cadette Girl Scout Handbook*. New York: Girl Scouts of the United States of America, 1995.
- Fagerström K-O. Reducing the weight gain after stopping smoking. *Addictive Behaviors* 1987;12(1):91-3.
- Farquhar JW. The community-based model of life style intervention trials. *American Journal of Epidemiology* 1978;108(2):103-11.
- Farquhar JW, Maccoby N, Wood PD, Alexander JK, Breitrose H, Brown BW Jr, Haskell WL, McAlister AL, Meyer AJ, Nash JD, Stern MP. Community education for cardiovascular health. *Lancet* 1977;1(8023):1192-5.
- Ferris J. Butt out: publishers and their tobacco habit. *Columbia Journalism Review* 1994;Jan-Feb:16-8.
- Ferris RM, Cooper BR. Mechanism of antidepressant activity of bupropion. *Journal of Clinical Psychiatry Monograph* 1993;11(1):2-14.
- Ferry LH, Robbins AS, Scariati PD, Masterson A, Abbey DE, Burchette RJ. Enhancement of smoking cessation using the antidepressant bupropion hydrochloride. *Circulation* 1992;86(4 Suppl I):I-671.
- Fielding JE, Piserchia PV. Frequency of worksite health promotion activities. *American Journal of Public Health* 1989;79(1):16-20.
- Fingerhut LA, Kleinman JC, Kendrick JS. Smoking before, during, and after pregnancy. *American Journal of Public Health* 1990;80(5):541-4.
- Fiore MC, Bailey WC, Cohen SJ, Dorfman SF, Goldstein MG, Gritz ER, Heyman RB, Holbrook J, Jaen CR, Kottke TE, Lando HA, Mecklenburg R, Mullen PD, Nett LM, Robinson K, Stitzer ML, Tommasello AC, Villejo L, Wewers ME. *Smoking Cessation*. Clinical Practice Guideline No. 18. Rockville (MD): U.S. Department of Health and Human Services, Public Health Service, Agency

- for Health Care Policy and Research, 1996. AHCPR Publication No. 96-0692.
- Fiore MC, Bailey WC, Cohen SJ, Dorfman SF, Goldstein MG, Gritz ER, Heyman RB, Jaén CR, Kottke TE, Lando HA, Mecklenburg R, Mullen PD, Nett LM, Robinson K, Stitzer ML, Tommasello AC, Villejo L, Wewers ME. *Treating Tobacco Use and Dependence*. Clinical Practice Guideline. U.S. Department of Health and Human Services, Public Health Service, 2000.
- Fiore MC, Jorenby DE, Baker TB, Kenford SL. Tobacco dependence and the nicotine patch: clinical guidelines for effective use. *Journal of the American Medical Association* 1992;268(19):2687-94.
- Fiore MC, Novotny TE, Pierce JP, Giovino GA, Hatziandreu EJ, Newcomb PA, Surawicz TS, Davis RM. Methods used to quit smoking in the United States: do cessation programs help? *Journal of the American Medical Association* 1990;263(20):2760-5.
- Fiore MC, Smith SS, Jorenby DE, Baker TB. The effectiveness of the nicotine patch for smoking cessation: a meta-analysis. *Journal of the American Medical Association* 1994;271(24):1940-7.
- Fisher EB Jr. Two approaches to social support in smoking cessation: commodity model and nondirective support. *Addictive Behaviors* 1997;22(6):819-33.
- Fisher EB, Auslander WF, Munro JF, Arfken CL, Brownson RC, Owens NW. Neighbors for a smoke free north side: evaluation of a community organization approach to promoting smoking cessation among African Americans. *American Journal of Public Health* 1998;88(11):1658-63.
- Fisher EB Jr, Auslander WF, Sussman LJ, Arfken CL, Munro JR, Sykes RK, Sylvia SC, Strunk RC, Owens N, Harrison D, Jackson-Thompson J. Community organization and social support among African American women. Paper presented at the Office of Research on Women's Health Workshop on Recruitment and Retention of Women in Clinical Studies; 1993 July; Bethesda (MD).
- Fisher EB Jr, Bishop DB. Sex roles, social support, and smoking cessation. Paper presented at the Society of Behavioral Medicine; 1986 Mar; San Francisco.
- Fisher EB Jr, Haire-Joshu D, Morgan GD, Rehberg H, Rost K. Smoking and smoking cessation. *American Review of Respiratory Disease* 1990a;142(3):702-20.
- Fisher EB Jr, Rehberg HR, Beaupre PM, Hughes CR, Levitt-Gilmour T, Davis JR, DiLorenzo TM. Gender differences in response to social support in smoking cessation. Paper presented at the Association for Advancement of Behavior Therapy; 1991 Nov; New York.
- Fisher KJ, Glasgow RE, Terborg JR. Work site smoking cessation: a meta-analysis of long-term quit rates from controlled studies. *Journal of Occupational Medicine* 1990b;32(5):429-39.
- Flaxman J. Quitting smoking now or later: gradual, abrupt, immediate, and delayed quitting. *Behavior Therapy* 1978;9(2):260-70.
- Flay BR, Koepke D, Thomson SJ, Santi S, Best JA, Brown KS. Six-year follow-up of the first Waterloo School Smoking Prevention Trial. *American Journal of Public Health* 1989;79(10):1371-6.
- Flay BR, Ryan KB, Best JA, Brown KS, Kersell MW, d'Avernas JR, Zanna MP. Are social-psychological smoking prevention programs effective? The Waterloo Study. *Journal of Behavioral Medicine* 1985;8(1):37-59.
- Floyd RL, Rimer BK, Giovino GA, Mullen PD, Sullivan SE. A review of smoking in pregnancy: effects on pregnancy outcomes and cessation efforts. *Annual Review of Public Health* 1993;14:379-411.
- Flynn BS, Worden JK, Secker-Walker RH, Badger GJ, Geller BM. Cigarette smoking prevention effects of mass media and school interventions targeted to gender and age groups. *Journal of Health Education* 1995;26(Suppl 2):S-45-S-51.
- Forbes R. Smoke-free soccer: US women take the lead. *Tobacco Control* 1996;5(2):105-6.
- Forster JL, Hourigan M, McGovern P. Availability of cigarettes to underage youth in three communities. *Preventive Medicine* 1992;21(3):320-8.
- Forster JL, McBride C, Jeffery R, Schmid TL, Pirie PL. Support for restrictive tobacco policies among residents of selected Minnesota communities. *American Journal of Health Promotion* 1991;6(2):99-104.
- Fortmann SP, Killen JD. Nicotine gum and self-help behavioral treatment for smoking relapse prevention: results from a trial using population-based recruitment. *Journal of Consulting and Clinical Psychology* 1995;63(3):460-8.
- Fortmann SP, Taylor CB, Flora JA, Jatulis DE. Changes in adult cigarette smoking prevalence after 5 years of community health education: the Stanford Five-City Project. *American Journal of Epidemiology* 1993;137(1):82-96.
- Fraser T. Phasing out of point-of-sale tobacco advertising in New Zealand. *Tobacco Control* 1998;7(1):82-4.

- French SA, Jeffery RW, Klesges LM, Forster JL. Weight concerns and change in smoking behavior over two years in a working population. *American Journal of Public Health* 1995;85(5):720-2.
- French SA, Jeffery RW, Pirie PL, McBride CM. Do weight concerns hinder smoking cessation efforts? *Addictive Behaviors* 1992;17(3):219-26.
- Frye CA, Ward KD, Bliss RE, Garvey AJ. Influence of the menstrual cycle on smoking relapse and withdrawal symptoms. In: Keefe FJ, editor. *Society of Behavioral Medicine. Thirteenth Annual Scientific Sessions; 1992 Mar 25-28; New York*. Rockville (MD): Society of Behavioral Medicine, 1992:107.
- Galbally R. Using the money generated by increased tobacco taxation. Paper presented at the 9th World Conference on Tobacco and Health; 1994 Oct 10-14; Paris.
- Gallup Organization. *The Public's Attitudes Toward Cigarette Advertising and Cigarette Tax Increase*. Princeton (NJ): Gallup Organization, 1993.
- Gannon L, Hansel S, Goodwin J. Correlates of menopausal hot flashes. *Journal of Behavioral Medicine* 1987;10(3):277-85.
- Gebauer C, Kwo CY, Haynes EF, Wewers ME. A nurse-managed smoking cessation intervention during pregnancy. *Journal of Obstetric, Gynecologic, and Neonatal Nursing* 1998;27(1):47-53.
- Gerlach KK, Shopland DR, Hartman AM, Gibson JT, Pechacek TF. Workplace smoking policies in the United States: results from a national study of more than 100,000 workers. *Tobacco Control* 1997; 6(3):199-206.
- Gielen AC, Windsor R, Faden RR, O'Campo P, Repke J, Davis M. Evaluation of a smoking cessation intervention for pregnant women in an urban prenatal clinic. *Health Education Research: Theory and Practice* 1997;12(2):247-54.
- Gilchrist LD, Schinke SP, Nurius P. Reducing onset of habitual smoking among women. *Preventive Medicine* 1989;18(2):235-48.
- Gilpin E, Pierce JP, Goodman J, Burns D, Shopland D. Reasons smokers give for stopping smoking: do they relate to success in stopping? *Tobacco Control* 1992;1(4):256-63.
- Ginsberg D, Hall SM, Reus VI, Muñoz RF. Mood and depression diagnosis in smoking cessation. *Experimental and Clinical Psychopharmacology* 1995;3(4): 389-95.
- Giovino GA, Schooley MW, Zhu B-P, Chrismon JH, Tomar SL, Peddicord JP, Merritt RK, Husten CG, Eriksen MP. Surveillance for selected tobacco-use behaviors—United States, 1900-1994. *Morbidity and Mortality Weekly Report* 1994;43(SS-3):1-43.
- Girl Scouts of the United States of America. *A Resource Book for Senior Girl Scouts*. New York: Girl Scouts of the United States of America, 1995.
- Girl Scouts of the United States of America. Girl Scouts against smoking [announcement]. New York: Girl Scouts of the United States of America, Membership and Programs, 1996.
- Girls Incorporated of Alameda County. Report submitted for the outstanding program award: leadership and community action. San Leandro (CA): Girls Incorporated of Alameda County, 1995.
- Glanz K, Rimer BK. *Theory at a Glance: A Guide for Health Promotion Practice*. U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, 1995. NIH Publication No. 95-3896.
- Glasgow RE, Cummings KM, Hyland A. Relationship of worksite smoking policy to changes in employee tobacco use: findings from COMMIT. *Tobacco Control* 1997a;6(Suppl 2):S44-8.
- Glasgow RE, McCaul KD, Fisher KJ. Participation in worksite health promotion: a critique of the literature and recommendations for future practice. *Health Education Quarterly* 1993;20(3):391-408.
- Glasgow RE, Terborg JR, Hollis JF, Severson HH, Boles SM. Take heart: results from the initial phase of a work-site wellness program. *American Journal of Public Health* 1995;85(2):209-16.
- Glasgow RE, Terborg JR, Strycker LA, Boles SM, Hollis JF. Take Heart II: replication of a worksite health promotion trial. *Journal of Behavioral Medicine* 1997b;20(2):143-61.
- Glassman AH. Cigarette smoking: implications for psychiatric illness. *American Journal of Psychiatry* 1993;150(4):546-53.
- Glassman AH, Helzer JE, Covey LS, Cottler LB, Stetner F, Tipp JE, Johnson J. Smoking, smoking cessation, and major depression. *Journal of the American Medical Association* 1990;264(12):1546-9.
- Glassman AH, Stetner F, Walsh BT, Raizman PS, Fleiss JL, Cooper TB, Covey LS. Heavy smokers, smoking cessation, and clonidine: results of a double-blind, randomized trial. *Journal of the American Medical Association* 1988;259(19):2863-6.
- Glynn TJ. Relative effectiveness of physician-initiated smoking cessation programs. *Cancer Bulletin* 1988; 40(6):359-64.
- Glynn TJ. Essential elements of school-based smoking prevention programs. *Journal of School Health* 1989; 59(5):181-8.
- Glynn TJ, Boyd GM, Gruman JC. *Self-Guided Strategies for Smoking Cessation: A Program Planner's Guide*. U.S. Department of Health and Human Services,

- Public Health Service, National Institutes of Health, 1990. NIH Publication No. 91-3104.
- Gofin J, Gofin R, Abramson JH, Ban R. Ten-year evaluation of hypertension, overweight, cholesterol, and smoking control: the CHAD program in Jerusalem. *Preventive Medicine* 1986;15(3):304-12.
- Goldberg RJ, Ockene JK, Kristeller J, Kalan K, Landon J, Hosmer DW Jr. Factors associated with heavy smoking among men and women: the physician-delivered smoking intervention project. *American Heart Journal* 1993;125(3):818-23.
- Gonsalves L, Domb J, Gidwani G. Depression, chronic fatigue, and the premenstrual syndrome. *Primary Care* 1991;18(2):369-80.
- Gourlay SG, Forbes A, Marriner T, Pethica D, McNeil JJ. Prospective study of factors predicting outcome of transdermal nicotine treatment in smoking cessation. *British Medical Journal* 1994;309(6958):842-6.
- Graham H. Smoking in pregnancy: the attitudes of expectant mothers. *Social Science and Medicine* 1976;10(7-8):399-405.
- Graham H. *Women, Health and the Family*. Brighton (UK): Wheatsheaf Books, 1984.
- Graham H. Behaving well: women's health behaviour in context. In: Roberts H, editor. *Women's Health Counts*. London: Routledge, 1990:195-219.
- Graham H. *Smoking Among Working Class Mothers with Children: A Final Report*. Coventry (UK): University of Warwick, Department of Applied Social Studies, 1992.
- Graham JW, Johnson CA, Hansen WB, Flay BR, Gee M. Drug use prevention programs, gender, and ethnicity: evaluation of three seventh-grade Project SMART cohorts. *Preventive Medicine* 1990;19(3):305-13.
- Grande D, Muller M, Radcliffe T, Cho C, Lynn W. Women's organizations and the control of smoking among women. Paper presented at the American Stop Smoking Intervention Study for Cancer Prevention (ASSIST) Information Exchange Conference; 1995 Oct 17-18; Washington.
- Greaves L. *Smoke Screen: Women's Smoking and Social Control*. Halifax (Canada): Fernwood Publishing, 1996.
- Greaves L, Jordan J, McLellan D. How tobacco touches women's lives. *World Smoking and Health* 1994;19(2):2-3.
- Greenberg G, Thompson SG, Meade TW. Relation between cigarette smoking and use of hormonal replacement therapy for menopausal symptoms. *Journal of Epidemiology and Community Health* 1987;41(1):26-9.
- Greenberg RA, Strecher VJ, Bauman KE, Boat BW, Fowler MG, Keyes LL, Denny FW, Chapman RS, Stedman HC, LaVange LM, Glover LH, Haley NJ, Loda FA. Evaluation of a home-based intervention program to reduce infant passive smoking and lower respiratory illness. *Journal of Behavioral Medicine* 1994;17(3):273-90.
- Grinstead OA. Preventing weight gain following smoking cessation: a comparison of behavioral treatment approaches [dissertation]. Los Angeles: University of California, 1981.
- Gritz ER. Lung cancer: now, more than ever, a feminist issue [editorial]. *Cancer* 1993;43(4):197-9.
- Gritz ER. Biobehavioral factors in smoking and smoking cessation in women. In: Czajkowski SM, Hill DR, Clarkson TB, editors. *Women, Behavior, and Cardiovascular Disease. Proceedings of a Conference Sponsored by the Heart, Lung, and Blood Institute*. U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, 1994:53-67. NIH Publication No. 94-3309.
- Gritz ER, Berman BA, Bastani R, Wu M. A randomized trial of a self-help smoking cessation intervention in a nonvolunteer female population: testing the limits of the public health model. *Health Psychology* 1992;11(5):280-9.
- Gritz ER, Berman BA, Read LL, Marcus AC, Siau J. Weight change among registered nurses in a self-help smoking cessation program. *American Journal of Health Promotion* 1990;5(2):115-21.
- Gritz ER, Kristeller JL, Burns DM. Treating nicotine addiction in high-risk groups and patients with medical co-morbidity. In: Orleans CT, Slade J, editors. *Nicotine Addiction: Principles and Management*. New York: Oxford University Press, 1993:279-309.
- Gritz ER, Marcus AC, Berman BA, Read LL, Kanim LEA, Reeder SJ. Evaluation of a worksite self-help smoking cessation program for registered nurses. *American Journal of Health Promotion* 1988;3(2):2-35.
- Gritz ER, Nielsen IR, Brooks LA. Smoking cessation and gender: the influence of physiological, psychological, and behavioral factors. *Journal of the American Medical Women's Association* 1996;51(1-2):35-42.
- Gritz ER, Thompson B, Emmons K, Ockene JK, McLerran DF, Nielsen IR. Gender differences among smokers and quitters in the Working Well Trial. *Preventive Medicine* 1998;27(4):553-61.
- Gross J, Johnson J, Sigler L, Stitzer ML. Dose effects of nicotine gum. *Addictive Behaviors* 1995;20(3):371-81.

- Gross J, Stitzer ML, Maldonado J. Nicotine replacement: effects on postcessation weight gain. *Journal of Consulting and Clinical Psychology* 1989;57(1): 87-92.
- Grunberg NE, Winders SE, Wewers ME. Gender differences in tobacco use. *Health Psychology* 1991; 10(2):143-53.
- Gulick EE, Shaw V, Allison M. Dietary practices and pregnancy discomforts among urban Blacks. *Journal of Perinatology* 1989;9(3):271-80.
- Gunn RC. Reactions to withdrawal symptoms and success in smoking cessation clinics. *Addictive Behaviors* 1986;11(1):49-53.
- Gurdon MA, Flynn BS. Smoking policies in the workplace—the impact of gender. *Social Science Quarterly* 1996;77(3):674-84.
- Hahn LP, Folsom AR, Sprafka JM, Norsted SW. Cigarette smoking and cessation behaviors among urban Blacks and Whites. *Public Health Reports* 1990;105(3):290-5.
- Hajek P, Jackson P, Belcher M. Long-term use of nicotine chewing gum: occurrence, determinants, and effect on weight gain. *Journal of the American Medical Association* 1988;260(11):1593-6.
- Halbreich U, Endicott J. Methodological issues in studies of premenstrual changes. *Psychoneuroendocrinology* 1985;10(1):15-32.
- Hall SM, Ginsberg D, Jones RT. Smoking cessation and weight gain. *Journal of Consulting and Clinical Psychology* 1986;54(3):342-6.
- Hall SM, Muñoz RF, Reus VI. Cognitive-behavioral intervention increases abstinence rates for depressive-history smokers. *Journal of Consulting and Clinical Psychology* 1994;62(1):141-6.
- Hall SM, Muñoz RF, Reus VI, Sees KL. Nicotine, negative affect, and depression. *Journal of Consulting and Clinical Psychology* 1993;61(5):761-7.
- Hall SM, Muñoz RF, Reus VI, Sees KL, Duncan C, Humfleet GL, Hartz DT. Mood management and nicotine gum in smoking treatment: a therapeutic contact and placebo controlled study. *Journal of Consulting and Clinical Psychology* 1996;64(5): 1003-9.
- Hall SM, Reus VI, Muñoz RF, Sees KL, Humfleet G, Hartz DT, Frederick S, Triffleman E. Nortriptyline and cognitive-behavioral therapy in the treatment of cigarette smoking. *Archives of General Psychiatry* 1998;55(8):683-90.
- Hall SM, Tunstall CD, Vila KL, Duffy J. Weight gain prevention and smoking cessation: cautionary findings. *American Journal of Public Health* 1992; 82(6):799-803.
- Hampson E, Kimura D. Reciprocal effects of hormonal fluctuations on human motor and perceptual-spatial skills. *Behavioral Neuroscience* 1988;102(3): 456-9.
- Hartmann KE, Thorp JM Jr, Pahel-Short L, Koch MA. A randomized controlled trial of smoking cessation intervention in pregnancy in an academic clinic. *Obstetrics and Gynecology* 1996;87(4):621-6.
- Hatsukami D, Skoog K, Allen S, Bliss R. Gender and the effects of different doses of nicotine gum on tobacco withdrawal symptoms. *Experimental and Clinical Psychopharmacology* 1995;3(2):163-73.
- Hatziandreu EJ, Pierce JP, Lefkopoulou M, Fiore MC, Mills SL, Novotny TE, Giovino GA, Davis RM. Quitting smoking in the United States in 1986. *Journal of the National Cancer Institute* 1990;82(17): 1402-6.
- Health Promotion Agency of Northern Ireland and Ulster Cancer Foundation. *First International Conference on Women and Smoking. Conference Proceedings and Recommendations for Action; 1992 Oct 5-7; Newcastle, Northern Ireland*. Geneva: International Union Against Cancer, 1993.
- Hebel JR, Fox NL, Sexton M. Dose-response of birth weight to various measures of maternal smoking during pregnancy. *Journal of Clinical Epidemiology* 1988;41(5):483-9.
- Hebel JR, Nowicki P, Sexton M. The effect of anti-smoking intervention during pregnancy: an assessment of interactions with maternal characteristics. *American Journal of Epidemiology* 1985; 122(1):135-48.
- Henningfield JE. Nicotine medications for smoking cessation. *New England Journal of Medicine* 1995; 333(18):1196-203.
- Hetherington MM, Burnett L. Ageing and the pursuit of slimness: dietary restraint and weight satisfaction in elderly women. *British Journal of Clinical Psychology* 1994;33(Pt 3):391-400.
- Hill RD, Rigdon M, Johnson S. Behavioral smoking cessation treatment for older chronic smokers. *Behavior Therapy* 1993;24(2):321-9.
- Hjalmarsen AIM, Hahn L, Svanberg B. Stopping smoking in pregnancy: effect of a self-help manual in controlled trial. *British Journal of Obstetrics and Gynaecology* 1991;98(3):260-4.
- Hollis JF, Vogt TM, Stevens V, Biglan A, Severson H, Lichtenstein E. The Tobacco Reduction and Cancer Control (TRACC) program: team approaches to counseling in medical and dental settings. In: *Tobacco and the Clinician: Interventions for Medical and Dental Practice*. Smoking and Tobacco Control

- Monograph 5. U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Cancer Institute, 1994:143-68. NIH Publication No. 94-3693.
- Hornsby PP, Wilcox AJ, Weinberg CR. Cigarette smoking and disturbance of menstrual function. *Epidemiology* 1998;9(2):193-8.
- Hu TW, Lin Z, Keeler TE. Teenage smoking, attempts to quit, and school performance. *American Journal of Public Health* 1998;88(6):940-3.
- Hughes JR. Pharmacotherapy for smoking cessation: unvalidated assumptions, anomalies, and suggestions for future research. *Journal of Consulting and Clinical Psychology* 1993;61(5):751-60.
- Hughes JR. Treatment of nicotine dependence: is more better? [editorial] *Journal of the American Medical Association* 1995;274(17):1390-1.
- Hughes JR, Goldstein MG, Hurt RD, Shiffman S. Recent advances in the pharmacotherapy of smoking. *Journal of the American Medical Association* 1999;281(1):72-6.
- Hughes JR, Gust SW, Skoog K, Keenan RM, Fenwick JW. Symptoms of tobacco withdrawal: a replication and extension. *Archives of General Psychiatry* 1991;48(1):52-9.
- Hughes JR, Hatsukami D. Signs and symptoms of tobacco withdrawal. *Archives of General Psychiatry* 1986;43(3):289-94.
- Hurt RD, Croghan GA, Beede SD, Wolter TD, Croghan IT, Patten CA. Nicotine patch therapy in 101 adolescent smokers: efficacy, withdrawal symptom relief, and carbon monoxide and plasma cotinine levels. *Archives of Pediatric and Adolescent Medicine* 2000;154(1):31-7.
- Hurt RD, Sachs DP, Glover ED, Offord KP, Johnston JA, Dale LC, Khayrallah MA, Schroeder DR, Glover PN, Sullivan CR, Croghan IT, Sullivan PM. A comparison of sustained-release bupropion and placebo for smoking cessation [see comments]. *New England Journal of Medicine* 1997;337(17):1195-202.
- IEG. IEG intelligence report on tobacco company sponsorship for the Robert Wood Johnson Foundation: 1995 Sponsorships. Chicago: IEG, 1995.
- International Network of Women Against Tobacco. INWAT Constitution: draft as of 14 Mar 1994. Washington: American Public Health Association, 1994.
- International Network of Women Against Tobacco. *The Net* [newsletter]. 1995 Sept.
- International Network of Women Against Tobacco. *The Net* [newsletter]. 1999 Summer.
- Jacobs MA, Spilken AZ, Norman MM, Wohlberg GW, Knapp PH. Interaction of personality and treatment conditions associated with success in a smoking control program. *Psychosomatic Medicine* 1971;33(6):545-56.
- Jarvik ME, Henningfield JE. Pharmacological adjuncts for the treatment of tobacco dependence. In: Orleans CT, Slade J, editors. *Nicotine Addiction: Principles and Management*. New York: Oxford University Press, 1993:245-61.
- Jarvis MJ. Gender differences in smoking cessation: real or myth? *Tobacco Control* 1994;3(4):324-8.
- Jeffery RW, Boles SM, Strycker LA, Glasgow RE. Smoking-specific weight gain concerns and smoking cessation in a working population. *Health Psychology* 1997;16(5):487-9.
- Jeffery RW, Forster JL, French SA, Kelder SH, Lando HA, McGovern PG, Jacobs DR Jr, Baxter JE. The Healthy Worker Project: a work-site intervention for weight control and smoking cessation. *American Journal of Public Health* 1993;83(3):395-401.
- Jensen PM, Coombs RB. Cigarette smoking and adolescent menstrual disorders. *Canadian Woman Studies* 1994;14(3):57-60.
- Johnson L. A case study of changing advertising policies in women's magazines. Paper presented at the 115th Annual Meeting of the American Public Health Association and Related Organizations; 1987 Oct 18-Oct 22; New Orleans.
- Johnson KM, Lando HA, Schmid LS, Solberg LI. The GAINS project: outcome of smoking cessation strategies in four urban Native American clinics. *Addictive Behaviors* 1997;22(2):207-18.
- Jones R, Manfredi C, Mermelstein R, Raju N, Thomas V. The Head Start parent involvement program as a vehicle for smoking reduction intervention. *Journal of Family and Community Health* 1994;17:1-12.
- Jordan J. Introduction. *World Smoking and Health* 1992; 17(1):2-4.
- Jorenby DE. New developments in approaches to smoking cessation. *Current Opinion in Pulmonary Medicine* 1998;4(2):103-6.
- Jorenby DE, Leischow SJ, Nides MA, Rennard SI, Johnston JA, Hughes AR, Smith SS, Muramoto ML, Daughton DM, Doan K, Fiore MC, Baker TB. A controlled trial of sustained-release bupropion, a nicotine patch, or both for smoking cessation [see comments]. *New England Journal of Medicine* 1999;340(9):685-91.
- Jorenby DE, Smith SS, Fiore MC, Hurt RD, Offord KP, Croghan IT, Hays JT, Lewis SF, Baker TB. Varying nicotine patch dose and type of smoking cessation

- counseling. *Journal of the American Medical Association* 1995;274(17):1347–52.
- Kauffman SE, Silver P, Poulin J. Gender differences in attitudes toward alcohol, tobacco, and other drugs. *Social Work* 1997;42(3):231–41.
- Kawachi I, Troisi RJ, Rotnitzky AG, Coakley EH, Colditz GA. Can physical activity minimize weight gain in women after smoking cessation? *American Journal of Public Health* 1996;86(7):999–1004.
- Keeler TE, Hu T-W, Barnett PG, Manning WG. Taxation, regulation, and addiction: a demand function for cigarettes based on time-series evidence. *Journal of Health Economics* 1993;12(1):1–18.
- Keintz MK, Fleisher L, Rimer BK. Reaching mothers of preschool-aged children with a targeted quit smoking intervention. *Journal of Community Health* 1994;19(1):25–40.
- Kelder SH, Perry CL, Peters RJ Jr, Lytle LL, Klepp K-I. Gender differences in the Class of 1989 study: the school component of the Minnesota Heart Health Program. *Journal of Health Education* 1995;26(Suppl 2):S-36–S-44.
- Kendler KS, Neale MC, MacLean CJ, Heath AC, Eaves LJ, Kessler RC. Smoking and major depression: a causal analysis. *Archives of General Psychiatry* 1993;50(1):36–43.
- Kendrick JS, Zahniser SC, Miller N, Salas N, Stine J, Gargiullo PM, Floyd RL, Spierto FW, Sexton M, Metzger RW, Stockbauer JW, Hannon WH, Dalmat ME. Integrating smoking cessation into routine public prenatal care: the Smoking Cessation in Pregnancy project. *American Journal of Public Health* 1995;85(2):217–22.
- Kenford SL, Fiore MC, Jorenby DE, Smith SS, Wetter D, Baker TB. Predicting smoking cessation: who will quit with and without the nicotine patch. *Journal of the American Medical Association* 1994;271(8):589–94.
- Killen JD, Fortmann SP, Newman B. Weight change among participants in a large sample minimal contact smoking relapse prevention trial. *Addictive Behaviors* 1990a;15(4):323–32.
- Killen JD, Fortmann SP, Newman B, Varady A. Evaluation of a treatment approach combining nicotine gum with self-guided behavioral treatments for smoking relapse prevention. *Journal of Consulting and Clinical Psychology* 1990b;58(1):85–92.
- Killen JD, Fortmann SP, Telch MJ, Newman B. Are heavy smokers different from light smokers? A comparison after 48 hours without cigarettes. *Journal of the American Medical Association* 1988;260(11):1581–5.
- King AC, Taylor CB, Haskell WL. Smoking in older women: is being female a 'risk factor' for continued cigarette use? *Archives of Internal Medicine* 1990;150(9):1841–6.
- King TK, Borrelli B, Black C, Pinto BM, Marcus BH. Minority women and tobacco: implications for smoking cessation interventions. *Annals of Behavioral Medicine* 1997;19(3):301–13.
- Klepp K-I, Tell GS, Vellar OD. Ten-year follow-up of the Oslo Youth Study Smoking Prevention Program. *Preventive Medicine* 1993;22(4):453–62.
- Klesges RC, Brown K, Pascale RW, Murphy M, Williams E, Cigrang JA. Factors associated with participation, attrition, and outcome in a smoking cessation program at the workplace. *Health Psychology* 1988;7(6):575–89.
- Klesges RC, Klesges LM. Cigarette smoking as a dieting strategy in a university population. *International Journal of Eating Disorders* 1988;7(3):413–9.
- Klesges RC, Klesges LM, Meyers AW. Relationship of smoking status, energy balance, and body weight: analysis of the second National Health and Nutrition Examination Survey. *Journal of Consulting and Clinical Psychology* 1991;59(6):899–905.
- Klesges RC, Klesges LM, Meyers AW, Klem ML, Isbell T. The effects of phenylpropanolamine on dietary intake, physical activity, and body weight after smoking cessation. *Clinical Pharmacology and Therapeutics* 1990;47(6):747–54.
- Kluger R. *Ashes to Ashes: America's Hundred-Year Cigarette War, the Public Health, and the Unabashed Triumph of Philip Morris*. New York: Knopf, 1996.
- Kottke TE, Battista RN, DeFries GH, Brekke ML. Attributes of successful smoking cessation interventions in medical practice: a meta-analysis of 39 controlled trials. *Journal of the American Medical Association* 1988;259(19):2882–9.
- Kozlowski LT, Porter CQ, Orleans CT, Pope MA, Heatherton T. Predicting smoking cessation with self-reported measures of nicotine dependence: FTQ, FTND, and HSI. *Drug and Alcohol Dependence* 1994;34(3):211–6.
- Lacey LP, Manfredi C, Balch G, Warnecke RB, Allen K, Edwards C. Social support in smoking cessation among black women in Chicago public housing. *Public Health Reports* 1993;108(3):387–94.
- Lam TH, Chung SF, Betson CL, Wong CM, Hedley AJ. Tobacco advertisements: one of the strongest risk factors for smoking in Hong Kong students. *American Journal of Preventive Medicine* 1998;14(3):217–23.

- Lam W, Sze PC, Sacks HS, Chalmers TC. Meta-analysis of randomized controlled trials of nicotine chewing-gum. *Lancet* 1987;2(8549):27-30.
- Lando HA. Formal quit smoking treatments. In: Orleans CT, Slade J, editors. *Nicotine Addiction: Principles and Management*. New York: Oxford University Press, 1993:221-44.
- Lando HA, Gritz ER. Smoking cessation techniques. *Journal of the American Medical Women's Association* 1996;51(1-2):31-4, 47.
- Lando HA, Johnson KM, Graham-Tomasi RP, McGovern PG, Solberg L. Urban Indians' smoking patterns and interest in quitting. *Public Health Reports* 1992;107(3):340-4.
- Lando HA, Pechacek TF, Pirie PL, Murray DM, Mittelmark MB, Lichtenstein E, Nothwehr F, Gray C. Changes in adult cigarette smoking in the Minnesota Heart Health Program. *American Journal of Public Health* 1995;85(2):201-8.
- Lando HA, Pirie PL, Hellerstedt WL, McGovern PG. Survey of smoking patterns, attitudes, and interest in quitting. *American Journal of Preventive Medicine* 1991;7(1):18-23.
- Laugesen M, Meads C. Tobacco advertising restrictions, price, income and tobacco consumption in OECD countries, 1960-1986. *British Journal of Addiction* 1991;86(10):1343-54.
- Leischow SJ, Sachs DPL, Bostrom AG, Hansen MD. Effects of differing nicotine-replacement doses on weight gain after smoking cessation. *Archives of Family Medicine* 1992;1(2):233-7.
- Lewit EM, Coate D. The potential for using excise taxes to reduce smoking. *Journal of Health Economics* 1982;1(2):121-45.
- Lewit EM, Hyland A, Kerrebrock N, Cummings KM. Price, public policy, and smoking in young people. *Tobacco Control* 1997;6(Suppl 2):S17-S24.
- Li CQ, Windsor RA, Perkins L, Goldenberg RL, Lowe JB. The impact on infant birth weight and gestational age of cotinine-validated smoking reduction during pregnancy. *Journal of the American Medical Association* 1993;269(12):1519-24.
- Lichtenstein E. Behavioral research contributions and needs in cancer prevention and control: tobacco use prevention and cessation. *Preventive Medicine* 1997;26(5 Pt 2):S57-S63.
- Lightwood JM, Phibbs CS, Glantz SA. Short-term health and economic benefits of smoking cessation: low birth weight. *Pediatrics* 1999;104(6):1312-20.
- Lillington L, Royce J, Novak D, Ruvalcaba M, Chlebowski R. Evaluation of a smoking cessation program for pregnant minority women. *Cancer Practice* 1995;3(3):157-63.
- Lipkus IM, Lyna PR, Rimer BK. Using tailored messages to enhance smoking cessation among African-Americans at a community health center. *Nicotine and Tobacco Research* 1999;1(1):77-85.
- Lowe JB, Windsor R, Balanda KP, Woodby L. Smoking relapse prevention methods for pregnant women: a formative evaluation. *American Journal of Health Promotion* 1997;11(4):244-6.
- Lumley J, Astbury J. Advice for pregnancy. In: Chalmers I, Enkin M, Keirse MJNC, editors. *Effective Care in Pregnancy and Childbirth*. Vol. 1, Pregnancy. Pts 1-5. Oxford: Oxford University Press, 1989:237-54.
- Lynch BS, Bonnie RJ, editors. *Growing Up Tobacco Free: Preventing Nicotine Addiction in Children and Youths*. Washington: National Academy Press, 1994.
- Macaskill P, Pierce JP, Simpson JM, Lyle DM. Mass media-led antismoking campaign can remove the education gap in quitting behavior. *American Journal of Public Health* 1992;82(1):96-8.
- Maccoby N, Farquhar JW, Wood PD, Alexander J. Reducing the risk of cardiovascular disease: effects of a community-based campaign on knowledge and behavior. *Journal of Community Health* 1977;3(2):100-14.
- Mackay JM. Smoking and women. Paper presented at the 15th International Cancer Congress; 1990 Aug 16-22; Hamburg (Federal Republic of Germany).
- Mackay JM, Hedley A. Hong Kong bans tobacco advertising. *British Medical Journal* 1997;315(7099):8.
- Macken KM, Wilder D, Mersy DJ, Madlon-Kay DJ. Smoking patterns in a low-income urban population: a challenge to smoking cessation efforts. *Journal of Family Practice* 1991;31(6):93, 95-6.
- Mahood G. Treating the tobacco epidemic like an epidemic: the road to effective tobacco control in Canada. In: Durston B, Jamrozik K, editors. *Tobacco and Health 1990: The Global War. Proceedings of the Seventh World Conference on Tobacco and Health, 1st-5th April 1990, Perth, Western Australia*. East Perth (Australia): Organising Committee of the Seventh World Conference on Tobacco and Health, 1990:88-97.
- Manfredi C, Lacey L, Warnecke R, Buis M. Smoking-related behavior, beliefs, and social environment of young Black women in subsidized public housing in Chicago. *American Journal of Public Health* 1992;82(2):267-72.
- Manfredi C, Lacey LP, Warnecke R, Petraitis J. Sociopsychological correlates of motivation to quit smoking among low-SES African American women. *Health Education and Behavior* 1998;25(3):304-18.

- Manley MW, Pierce JP, Gilpin EA, Rosbrook B, Berry C, Wun L. Impact of the American Stop Smoking Intervention Study on cigarette consumption. *Tobacco Control* 1997;6(Suppl 2):S12-S16.
- Marcus BH, Albrecht AE, King TK, Parisi AF, Pinto BM, Roberts M, Niaura RS, Abrams DB. The efficacy of exercise as an aid for smoking cessation in women: a randomized controlled trial. *Archives of Internal Medicine* 1999;159(11):1229-34.
- Marcus BH, Albrecht AE, Niaura RS, Abrams DB, Thompson PD. Usefulness of physical exercise for maintaining smoking cessation in women. *American Journal of Cardiology* 1991;68(4):406-7.
- Marcus BH, Albrecht AE, Niaura RS, Taylor ER, Simkin LR, Feder SI, Abrams DB, Thompson PD. Exercise enhances the maintenance of smoking cessation in women. *Addictive Behaviors* 1995;20(1):87-92.
- Marcus BH, Emmons KM, Simkin LR, Albrecht AE, Stoney CM, Abrams DB. Women and smoking cessation: current status and future directions. *Medicine, Exercise, Nutrition and Health* 1994;3(1):17-31.
- Marín G, Marín BV, Pérez-Stable EJ, Sabogal F, Otero-Sabogal R. Changes in information as a function of a culturally appropriate smoking cessation community intervention for Hispanics. *American Journal of Community Psychology* 1990a;18(6):847-64.
- Marín G, Marín BV, Pérez-Stable EJ, Sabogal F, Otero-Sabogal R. Cultural differences in attitudes and expectancies between Hispanic and non-Hispanic White smokers. *Hispanic Journal of Behavioral Sciences* 1990b;12(4):422-36.
- Marín G, Pérez-Stable EJ. Effectiveness of disseminating culturally appropriate smoking-cessation information: Programa Latina para Dejar de Fumar. *Journal of the National Cancer Institute Monographs* 1995;18:155-63.
- Marín G, Pérez-Stable EJ, Marín BV. Cigarette smoking among San Francisco Hispanics: the role of acculturation and gender. *American Journal of Public Health* 1989;79(2):196-8.
- Mark EJ, Patalas ED, Chang HT, Evans RJ, Kessler SC. Fatal pulmonary hypertension associated with short-term use of fenfluramine and phentermine. *New England Journal of Medicine* 1997;337(9):602-6.
- Marks JL. An evaluation of the proposed DSM-III-R criteria for late luteal phase dysphoric disorder based on personal and family-history characteristics of women perceiving themselves as having premenstrual syndrome [dissertation]. Storrs (CT): University of Connecticut, 1992.
- Marks JL, Hair CS, Klock SC, Ginsburg BE, Pomerleau CS. Effects of menstrual phase on intake of nicotine, caffeine, and alcohol and nonprescribed drugs in women with late luteal phase dysphoric disorder. *Journal of Substance Abuse* 1994;6(2):235-43.
- Marks JL, Pomerleau CS, Pomerleau OF. Effects of menstrual phase on reactivity to nicotine. *Addictive Behaviors* 1999;24(1):127-34.
- Marlatt GA, Curry S, Gordon JR. A longitudinal analysis of unaided smoking cessation. *Journal of Consulting and Clinical Psychology* 1988;56(5):715-20.
- Marsh A, McKay S. *Poor Smokers*. London: Policy Studies Institute, 1994.
- Masson CL. Cardiovascular and mood responses to a quantified dose of nicotine in oral contraceptive users and nonusers [dissertation]. Carbondale (IL): Southern Illinois University, 1995.
- Matthews KA, Bromberger J, Egeland G. Behavioral antecedents and consequences of the menopause. In: Korenman SG, editor. *The Menopause. Biological and Clinical Consequences of Ovarian Failure: Evolution and Management*. Norwell (MA): Serono Symposia, 1990:1-15.
- Mayer JP, Hawkins B, Todd R. A randomized evaluation of smoking cessation interventions for pregnant women at a WIC clinic. *American Journal of Public Health* 1990;80(1):76-8.
- McAlister A, Puska P, Salonen JT, Tuomilehto J, Koskela K. Theory and action for health promotion: illustrations from the North Karelia Project. *American Journal of Public Health* 1982;72(1):43-50.
- McBride CM, Curry SJ, Lando HA, Pirie PL, Grothaus LC, Nelson JC. Prevention of relapse in women who quit smoking during pregnancy. *American Journal of Public Health* 1999;89(5):706-11.
- McBride CM, Pirie PL. Postpartum smoking relapse. *Addictive Behaviors* 1990;15(2):165-8.
- McBride CM, Pirie PL, Curry SJ. Postpartum relapse to smoking: a prospective study. *Health Education Research* 1992;7(3):381-90.
- McGovern PG, Lando HA, Roski J, Pirie PL, Sprafka JM. A comparison of smoking cessation clinic participants with smokers in the general population. *Tobacco Control* 1994;3(4):329-33.
- McGrath E, Keita GP, Strickland BR, Russo NF, editors. *Women and Depression: Risk Factors and Treatment Issues. Final Report of the American Psychological Association's National Task Force on Women and Depression*. Washington: American Psychological Association, 1990.

- McLellan DL. The International Network of Women Against Tobacco. Paper presented at the 118th Annual Meeting of the American Public Health Association; 1990 Oct 3; New York.
- McLellan DL, da Costa e Silva VL, Chollat-Traquet C. Building women's leadership in tobacco control. *Tobacco Alert* 1992 July:3.
- McLellan DL, Wright J. The National Women's Tobacco Control Plan. *Journal of Public Health Policy* 1996; 17(1):47-58.
- Meier KJ, Licari MJ. The effect of cigarette taxes on cigarette consumption, 1955 through 1994. *American Journal of Public Health* 1997;87(7):1126-30.
- Mello NK, Mendelson JH, Palmieri SL. Cigarette smoking by women: interactions with alcohol use. *Psychopharmacology* 1987;93(1):8-15.
- Mermelstein R. Preventing weight gain following smoking cessation. Paper presented at the Society of Behavioral Medicine Eighth Annual Scientific Session; 1987 Mar; Washington.
- Mermelstein R, Cohen S, Lichtenstein E, Baer JS, Kamarck T. Social support and smoking cessation and maintenance. *Journal of Consulting and Clinical Psychology* 1986;54(4):447-53.
- Mermelstein RJ, Borrelli B. Women and smoking. In: Stanton AL, Gallant SJ, editors. *The Psychology of Women's Health: Progress and Challenges in Research and Application*. Washington: American Psychological Association, 1995:307-48.
- Messimer SR, Hickner JM, Henry RC. A comparison of two antismoking interventions among pregnant women in eleven private primary care practices. *Journal of Family Practice* 1989;28(3):283-8.
- Meyer AJ, Nash JD, McAlister AL, Maccoby N, Farquhar JW. Skills training in a cardiovascular health education campaign. *Journal of Consulting and Clinical Psychology* 1980;48(2):129-42.
- Meyers AW, Klesges RC, Winders SE, Ward KD, Peterson BA, Eck LH. Are weight concerns predictive of smoking cessation? A prospective analysis. *Journal of Consulting and Clinical Psychology* 1997; 65(3):448-52.
- Michnovicz JJ, Hershcopf RJ, Naganuma H, Bradlow HL, Fishman J. Increased 2-hydroxylation of estradiol as a possible mechanism for the anti-estrogenic effect of cigarette smoking. *New England Journal of Medicine* 1986;315(21):1305-9.
- Millar WJ. Evaluation of the impact of smoking restrictions in a government work setting. *Canadian Journal of Public Health* 1988;79(5):379-82.
- Miller WR, Rollnick S. *Motivational Interviewing: Preparing People to Change Addictive Behavior*. New York: Guilford Press, 1991.
- Moolchan ET, Ernst M, Henningfield JE. A review of tobacco smoking in adolescents: treatment implications. *Journal of the American Academy of Child and Adolescent Psychiatry* 2000;39(6):682-93.
- Morgan D. Panel bans smoking on most flights: hill conferees accept 'milestone' limits for commercial carriers. *Washington Post* 1989 Oct 17;Sect A:1 (col 1).
- Morgan GD, Ashenberg ZS, Fisher EB Jr. Abstinence from smoking and the social environment. *Journal of Consulting and Clinical Psychology* 1988;56(2): 298-301.
- Morgan GD, Noll EL, Orleans CT, Rimer BK, Amfoh K, Bonney G. Reaching midlife and older smokers: tailored interventions for routine medical care. *Preventive Medicine* 1996;25(3):346-54.
- Morse Enterprises. The campaign. Paper prepared for the Capital City Chapter Links symposium to launch the pilot for the National Smoking Cessation Campaign for African American Women; 1992 Nov 21; Bethesda (MD). Silver Spring (MD): Morse Enterprises, 1992.
- Mullahy J. Cigarette smoking: habits, health concerns, and heterogeneous unobservables in a microeconomic analysis of consumer demand [dissertation]. Arlington (VA): University of Virginia, 1985.
- Mullen PD. Smoking cessation counseling in prenatal care. In: Merkatz IR, Thompson JE, Mullen PD, Goldenberg RL, editors. *New Perspectives on Prenatal Care*. New York: Elsevier Science Publishing, 1990:161-76.
- Mullen PD, Quinn VP, Ershoff DH. Maintenance of nonsmoking postpartum by women who stopped smoking during pregnancy. *American Journal of Public Health* 1990;80(8):992-4.
- Mullen PD, Richardson MA, Quinn VP, Ershoff DH. Postpartum return to smoking: who is at risk and when? *American Journal of Health Promotion* 1997; 11(5):323-30.
- Muñoz RF, Marín BV, Posner SF, Pérez-Stable EJ. Mood management mail intervention increases abstinence rates for Spanish-speaking Latino smokers. *American Journal of Community Psychology* 1997;25(3):325-43.
- Murray DM, Davis-Hearn M, Goldman AI, Pirie P, Luepker RV. Four- and five-year follow-up results from four seventh-grade smoking prevention strategies. *Journal of Behavioral Medicine* 1988;11(4): 395-405.
- Murray DM, Pirie P, Luepker RV, Pallonen U. Five- and six-year follow-up results from four seventh-grade smoking prevention strategies. *Journal of Behavioral Medicine* 1989;12(2):207-18.

- Murray DM, Richards PS, Luepker RV, Johnson CA. The prevention of cigarette smoking in children: two- and three-year follow-up comparisons of four prevention strategies. *Journal of Behavioral Medicine* 1987;10(6):595–611.
- Murray RP, Johnston JJ, Dolce JJ, Lee WW, O'Hara P. Social support for smoking cessation and abstinence: the Lung Health Study. Lung Health Study Research Group. *Addictive Behaviors* 1995;20(2):159–70.
- Myers MG. Smoking intervention with adolescent substance abusers. Initial recommendations. *Journal of Substance Abuse and Treatment* 1999;16(4):289–98.
- National Association for Public Health Policy. Policy on women and smoking [position statement]. Reston (VA): National Association for Public Health Policy, 1996.
- National Committee for Quality Assurance. *HEDIS 3.0. Vol. 2. Technical Specifications*. Washington, DC: National Committee for Quality Assurance, 1997.
- National Organization for Women. Resolution on women and tobacco passed by the National Organization for Women Board of Directors, Jan 21, 1991. Washington: National Organization for Women, 1991.
- Nevid J, Javier RA. Preliminary investigation of a culturally specific smoking cessation intervention for Hispanic smokers. *American Journal of Health Promotion* 1997(3);11:198–207.
- Niaura R, Goldstein MG, Depue J, Keuthen N, Kristeller J, Abrams D. Fluoxetine, symptoms of depression, and smoking cessation. *Annals of Behavioral Medicine* 1995;17(Suppl):S061.
- Niaura R, Shadel WG, Abrams DB, Monti PM, Rohsenow DJ, Sirota A. Individual differences in cue reactivity among smokers trying to quit: effects of gender and cue type. *Addictive Behaviors* 1998;23(2):209–24.
- Nides M, Rand C, Dolce J, Murray R, O'Hara P, Voelker H, Connett J. Weight gain as a function of smoking cessation and 2-mg nicotine gum use among middle-aged smokers with mild lung impairment in the first 2 years of the Lung Health Study. *Health Psychology* 1994;13(4):354–61.
- Nides MA, Rakos RF, Gonzales D, Murray RP, Tashkin DP, Bjornson-Benson WM, Lindgren P, Connett JE. Predictors of initial smoking cessation and relapse through the first 2 years of the Lung Health Study. *Journal of Consulting and Clinical Psychology* 1995;63(1):60–9.
- Novotny TE, Warner KE, Kendrick JS, Remington PL. Smoking by Blacks and Whites: socioeconomic and demographic differences. *American Journal of Public Health* 1988;78(9):1187–9.
- O'Campo P, Davis MV, Gielen AC. Smoking cessation interventions for pregnant women: review and future directions. *Seminars in Perinatology* 1995;19(4):279–85.
- O'Campo P, Faden RR, Brown H, Gielen AC. The impact of pregnancy on women's prenatal and postpartum smoking behavior. *American Journal of Preventive Medicine* 1992;8(1):8–13.
- Ockene JK. Physician-delivered interventions for smoking cessation: strategies for increasing effectiveness. *Preventive Medicine* 1987;16(5):723–37.
- Ockene JK. Smoking among women across the life span: prevalence, interventions, and implications for cessation research. *Annals of Behavioral Medicine* 1993;15(2–3):135–48.
- O'Hara P, Portser SA, Anderson BP. The influence of menstrual cycle changes on the tobacco withdrawal syndrome in women. *Addictive Behaviors* 1989;14(6):595–600.
- O'Loughlin J, Paradis G, Renaud L, Meshefedjian G, Barnett T. The "Yes, I Quit" smoking cessation course: does it help women in a low income community quit? *Journal of Community Health* 1997;22(6):451–68.
- Oncken CA, Hatsukami DK, Lupo VR, Lando HA, Gibeau LM, Hansen RJ. Effects of short-term use of nicotine gum in pregnant smokers. *Clinical Pharmacology and Therapeutics* 1996;59(6):654–61.
- Orleans CT, Boyd NR, Bingle R, Sutton C, Fairclough D, Heller D, McClatchey M, Ward JA, Graves C, Fleisher L, Baum S. A self-help intervention for African American smokers: tailoring cancer information service counseling for a special population. *Preventive Medicine* 1998;27(5 Pt 2):S61–S70.
- Orleans CT, Jepson C, Resch N, Rimer BK. Quitting motives and barriers among older smokers. The 1986 Adult Use of Tobacco Survey revisited. *Cancer* 1994a;74(7 Suppl):2055–61.
- Orleans CT, Resch N, Noll E, Keintz MK, Rimer BK, Brown TV, Snedden TM. Use of transdermal nicotine in a state-level prescription plan for the elderly: a first look at 'real-world' patch users. *Journal of the American Medical Association* 1994b;271(8):601–7.
- Orleans CT, Rimer BK, Cristinzio S, Jepson C, Quade D, Porter CQ, Keintz MK, Fleisher L, Schoenbach VJ. *Smoking Patterns and Quitting Motives, Barriers*

- and Strategies Among Older Smokers Aged 50–74: A Report for the American Association of Retired Persons. Philadelphia: Fox Chase Cancer Center, 1990.
- Orleans CT, Rimer BK, Cristinzio S, Keintz MK, Fleisher L. A national survey of older smokers: treatment needs of a growing population. *Health Psychology* 1991a;10(5):343–51.
- Orleans CT, Schoenbach VJ, Wagner EH, Quade D, Salmon MA, Pearson DC, Fiedler J, Porter CQ, Kaplan BH. Self-help quit smoking interventions: effects of self-help materials, social support instructions, and telephone counseling. *Journal of Consulting and Clinical Psychology* 1991b;59(3):439–48.
- Ossip-Klein DJ, Carosella AM, Krusch DA. Self-help interventions for older smokers. *Tobacco Control* 1997;6(3):188–93.
- Otero-Sabogal R, Sabogal F, Pérez-Stable E. Psychosocial correlates of smoking among immigrant Latina adolescents. *Journal of the National Cancer Institute Monographs* 1995;18:65–71.
- Pallonen UE, Redding CA, Willey CJ, Prochaska JO. Gender differences in readiness to quit smoking among vocational students. Paper presented at the American Psychological Association Conference, Behavioral Factors in Women's Health: Creating an Agenda for the 21st Century; 1994 May 11–14; Washington.
- Pallonen UE, Velicer WF, Prochaska JO, Rossi JS, Bellis JM, Tsoh JY, Migneault JP, Smith NF, Prokhorov AV. Computer-based smoking cessation interventions in adolescents: description, feasibility and six-month follow-up findings. *Substance Use and Misuse* 1998;33(4):935–65.
- Patten CA, Gilpin E, Cavin SW, Pierce JP. Workplace smoking policy and changes in smoking behaviour in California: a suggested association. *Tobacco Control* 1995a;4(1):36–41.
- Patten CA, Pierce JP, Cavin SW, Berry CC, Kaplan RM. Progress in protecting non-smokers from environmental tobacco smoke in California workplaces. *Tobacco Control* 1995b;4(2):139–44.
- Pentz MA, MacKinnon DP, Dwyer JH, Wang EYI, Hansen WB, Flay BR, Johnson CA. Longitudinal effects of the Midwestern Prevention Project on regular and experimental smoking in adolescents. *Preventive Medicine* 1989a;18(2):304–21.
- Pentz MA, MacKinnon DP, Flay BR, Hansen WB, Johnson CA, Dwyer JH. Primary prevention of chronic diseases in adolescence: effects of the Midwestern Prevention Project on tobacco use. *American Journal of Epidemiology* 1989b;130(4):713–24.
- Pérez-Stable EJ, Sabogal F, Marín G, Marín BV, Otero-Sabogal R. Evaluation of “Guía para Dejar de Fumar,” a self-help guide in Spanish to quit smoking. *Public Health Reports* 1991;106(5):564–70.
- Perkins KA. Issues in the prevention of weight gain after smoking cessation. *Annals of Behavioral Medicine* 1994;16(1):46–52.
- Perkins KA. Sex differences in nicotine versus non-nicotine reinforcement as determinants of tobacco smoking. *Experimental and Clinical Psychopharmacology* 1996;4(2):166–77.
- Perkins KA. Nicotine discrimination in men and women. *Pharmacology, Biochemistry and Behavior* 1999;64(2):295–9.
- Perkins KA, Donny E, Caggiula AR. Sex differences in nicotine effects and self-administration: review of human and animal evidence. *Nicotine and Tobacco Research* 1999;1(4):301–15.
- Perkins KA, Levine M, Marcus M, Shiffman S, D'Amico D, Miller A, Keins A, Ashcom J, Broge B. Tobacco withdrawal in women and menstrual cycle phase. *Journal of Consulting and Clinical Psychology* 2000;68(1):176–80.
- Perry CL, Kelder SH, Murray DM, Klepp K-I. Communitywide smoking prevention: long-term outcomes of the Minnesota Heart Health Program and the Class of 1989 study. *American Journal of Public Health* 1992;82(9):1210–6.
- Petersen L, Handel J, Kotch J, Podedworny T, Rosen A. Smoking reduction during pregnancy by a program of self-help and clinical support. *Obstetrics and Gynecology* 1992;79(6):924–30.
- Peterson DE, Zeger SL, Remington PL, Anderson HA. The effect of state cigarette tax increases on cigarette sales, 1955 to 1988. *American Journal of Public Health* 1992;82(1):94–6.
- Pierce JP, Evans N, Farkas AJ, Cavin SW, Berry C, Kramer M, Kealey S, Rosbrook B, Choi W, Kaplan RM. *Tobacco Use in California: An Evaluation of the Tobacco Control Program, 1989–1993*. La Jolla (CA): University of California, San Diego, 1994a.
- Pierce JP, Fiore MC, Novotny TE, Hatziandreu EJ, Davis RM. Trends in cigarette smoking in the United States: educational differences are increasing. *Journal of the American Medical Association* 1989;261(1):56–60.
- Pierce JP, Lee L, Gilpin EA. Smoking initiation by adolescent girls, 1944 through 1988: an association with targeted advertising. *Journal of the American Medical Association* 1994b;271(8):608–11.

- Pierce JP, Macaskill P, Hill D. Long-term effectiveness of mass media led antismoking campaigns in Australia. *American Journal of Public Health* 1990;80(5):565-9.
- Pirie PL, McBride CM, Hellerstedt W, Jeffery RW, Hatsukami D, Allen S, Lando H. Smoking cessation in women concerned about weight. *American Journal of Public Health* 1992;82(9):1238-43.
- Pirie PL, Murray DM, Luepker RV. Gender differences in cigarette smoking and quitting in a cohort of young adults. *American Journal of Public Health* 1991;81(3):324-7.
- Pirie PL, Rooney BL, Pechacek TF, Lando HA, Schmid LA. Incorporating social support into a community-wide smoking-cessation contest. *Addictive Behaviors* 1997;22(1):131-7.
- Pohl JM, Martinelli A, Antonakos C. Predictors of participation in a smoking cessation intervention group among low-income women. *Addictive Behaviors* 1998;23(5):699-704.
- Pomerleau CS. Smoking and nicotine replacement treatment issues specific to women. *American Journal of Health Behavior* 1996;20(5):291-9.
- Pomerleau CS, Cole PA, Lumley MA, Marks JL, Pomerleau OF. Effects of menstrual phase on nicotine, alcohol, and caffeine intake in smokers. *Journal of Substance Abuse* 1994a;6(2):227-34.
- Pomerleau CS, Garcia AW, Pomerleau OF, Cameron OG. The effects of menstrual phase and nicotine abstinence on nicotine intake and on biochemical and subjective measures in women smokers: a preliminary report. *Psychoneuroendocrinology* 1992;17(6):627-38.
- Pomerleau CS, Pomerleau OF. Gender differences in frequency of smoking withdrawal symptoms. *Annals of Behavioral Medicine* 1994;16(Suppl):S118.
- Pomerleau CS, Pomerleau OF, Garcia AW. Biobehavioral research on nicotine use in women. *British Journal of Addiction* 1991a;86(5):527-31.
- Pomerleau CS, Tate JC, Lumley MA, Pomerleau OF. Gender differences in prospectively versus retrospectively assessed smoking withdrawal symptoms. *Journal of Substance Abuse* 1994b;6(4):433-40.
- Pomerleau CS, Teuscher F, Goeters S, Pomerleau OF. Effects of nicotine abstinence and menstrual phase on task performance. *Addictive Behaviors* 1994c;19(4):357-62.
- Pomerleau OF, Pomerleau CS, Morrell EM, Lowenbergh JM. Effects of fluoxetine on weight gain and food intake in smokers who reduce nicotine intake. *Psychoneuroendocrinology* 1991b;16(5):433-40.
- Popham WJ, Potter LD, Bal DG, Johnson MD, Duerr JM, Quinn V. Do anti-smoking media campaigns help smokers quit? *Public Health Reports* 1993;108(4):510-3.
- Prochaska JO. Strong and weak principles for progressing from precontemplation to action on the basis of twelve problem behaviors. *Health Psychology* 1994;13(1):47-51.
- Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of Consulting and Clinical Psychology* 1983;51(3):390-5.
- Prochaska JO, DiClemente CC, Norcross JC. In search of how people change: applications to addictive behaviors. *American Psychologist* 1992;47(9):1102-14.
- Prochaska JO, DiClemente CC, Velicer WF, Rossi JS. Standardized, individualized, interactive, and personalized self-help programs for smoking cessation. *Health Psychology* 1993;12(5):399-405.
- Prochaska AV, Weaver MJ, Keller RT, Fryer GE, Licari PA, Lofaso D. A randomized trial of nortriptyline for smoking cessation. *Archives of Internal Medicine* 1998;158(18):1235-9.
- Procopé B-J, Timonen S. The premenstrual syndrome in relation to sport, gymnastics and smoking. *Acta Obstetrica et Gynecologica Scandinavica* 1971;9 (Suppl 9):77.
- Puska P, Nissinen A, Salonen JT, Tuomilehto [sic] J. Ten years of the North Karelia Project: results with community-based prevention of coronary heart disease. *Scandinavian Journal of Social Medicine* 1983a;11(3):65-8.
- Puska P, Salonen JT, Nissinen A, Tuomilehto J, Vartiainen E, Korhonen H, Tanskanen A, Rönnqvist P, Koskela K, Huttunen J. Change in risk factors for coronary heart disease during 10 years of a community intervention programme (North Karelia Project). *British Medical Journal* 1983b;287(6408):1840-4.
- Puska P, Tuomilehto J, Salonen J, Neittaanmäki L, Maki J, Virtamo J, Nissinen A, Koskela K, Takalo T. Changes in coronary risk factors during comprehensive five-year community programme to control cardiovascular diseases (North Karelia Project). *British Medical Journal* 1979;2(6199):1173-8.
- Quinn VP, Mullen PD, Ershoff DH. Women who stop smoking spontaneously prior to prenatal care and predictors of relapse before delivery. *Addictive Behaviors* 1991;16(1-2):29-40.

- Rafuse J. Smoking-cessation program targets low-income women. *Canadian Medical Association Journal* 1994;150(10):1683-4.
- Rásky E, Stronegger WJ, Freidl W. The relationship between body weight and patterns of smoking in women and men. *International Journal of Epidemiology* 1996;25(6):1208-12.
- Research Committee of the British Thoracic Society. Smoking cessation in patients: two further studies by the British Thoracic Society. *Thorax* 1990;45(11):835-40.
- Resnicow K, Vaughan R, Futterman R, Weston RE, Royce J, Parns C, Hearn MD, Smith M, Freeman HP, Orlandi MA. A self-help smoking cessation program for inner-city African Americans: results from the Harlem Health Connection Project. *Health Education and Behavior* 1997;24(2):201-17.
- Rimer BK, Orleans CT, Fleisher L, Cristinzio S, Resch N, Telepchak J, Keintz MK. Does tailoring matter? The impact of a tailored guide on ratings and short-term smoking-related outcomes for older smokers. *Health Education Research* 1994;9(1):69-84.
- Robinson RG, Barry M, Bloch M, Glantz S, Jordan J, Murray KB, Popper E, Sutton C, Tarr-Whelan K, Themba M, Younger S. Report of the Tobacco Policy Research Group on marketing and promotions targeted at African Americans, Latinos, and women. *Tobacco Control* 1992;1(Suppl):S24-S30.
- Rooney BL, Murray DM. A meta-analysis of smoking-prevention programs after adjustment for errors in the unit of analysis. *Health Education Quarterly* 1996;23(1):48-64.
- Royce JM, Ashford A, Resnicow K, Freeman HP, Caesar AA, Orlandi MA. Physician- and nurse-assisted smoking cessation in Harlem. *Journal of the National Medical Association* 1995;87(4):291-300.
- Royce JM, Corbett K, Sorensen G, Ockene J. Gender, social pressure, and smoking cessations: the Community Intervention Trial for Smoking Cessation (COMMIT) at baseline. *Social Science and Medicine* 1997;44(3):359-70.
- Rundall TG, Bruvold WH. A meta-analysis of school-based smoking and alcohol use prevention programs. *Health Education Quarterly* 1988;15(3):317-34.
- Russell PO, Epstein LH, Johnston JJ, Block DR, Blair E. The effects of physical activity as maintenance for smoking cessation. *Addictive Behaviors* 1988;13(2):215-8.
- Saad L. More Americans Fear Risk of Second-Hand Smoke. Princeton (NJ): Gallup Organization, 1997; <<http://www.gallup.com/poll/releases/pr970718.asp>>; accessed: November 29, 1999.
- Sabogal F, Otero-Sabogal R, Pérez-Stable EJ, Marín BV-O, Marín G. Perceived self-efficacy to avoid cigarette smoking and addiction: differences between Hispanics and non-Hispanic Whites. *Hispanic Journal of Behavioral Sciences* 1989;11(2):136-47.
- Salive ME, Cornoni-Huntley J, LaCroix AZ, Ostfeld AM, Wallace RB, Hennekens CH. Predictors of smoking cessation and relapse in older adults. *American Journal of Public Health* 1992;82(9):1268-71.
- Salonen JT, Puska P, Kottke TE, Tuomilehto J. Changes in smoking, serum cholesterol and blood pressure levels during a community-based cardiovascular disease prevention program—the North Karelia Project. *American Journal of Epidemiology* 1981;114(1):81-94.
- Samet JM, Coultas DB. *Clinics in Chest Medicine—Smoking Cessation*. Philadelphia: W.B. Saunders, 1991.
- Sargent JD, Mott LA, Stevens M. Predictors of smoking cessation in adolescents. *Archives of Pediatrics and Adolescent Medicine* 1998;152(4):388-93.
- Schiff I, Bell WR, Davis V, Kessler CM, Meyers C, Nakajima S, Sexton BJ. Oral contraceptives and smoking, current considerations: recommendations of a consensus panel. *American Journal of Obstetrics and Gynecology* 1999;180(6 Pt 2):S383-4.
- Schilling RF, Gilchrist LD, Schinke SP. Smoking in the workplace: review of critical issues. *Public Health Reports* 1985;100(5):473-9.
- Schorling JB, Roach J, Siegel M, Baturka N, Hunt DE, Guterbock TM, Stewart HL. A trial of church-based smoking cessation interventions for rural African Americans. *Preventive Medicine* 1997;26(1):92-101.
- Secker-Walker RH, Flynn BS, Solomon LJ, Vacek PM, Dorwaldt AL, Geller BM, Worden JK, Skelly JM. Helping women quit smoking: baseline observations for a community health education project. *American Journal of Preventive Medicine* 1996;12(5):367-77.
- Secker-Walker RH, Solomon LJ, Flynn BS, Skelly JM, Lepage SS, Goodwin GD, Mead PB. Individualized smoking cessation counseling during prenatal and early postnatal care. *American Journal of Obstetrics and Gynecology* 1994;171(5):1347-55.
- Secker-Walker RH, Solomon LJ, Flynn BS, Skelly JM, Lepage SS, Goodwin GD, Mead PB. Smoking relapse prevention counseling during prenatal and early postnatal care. *American Journal of Preventive Medicine* 1995;11(2):86-93.

- Seffrin JR. A European tobacco advertising ban. *Cancer Journal for Clinicians* 1998;48(4):254-6.
- Serxner S, Catalano R, Dooley D, Mishra S. Influences on cigarette smoking quantity: selection, stress, or culture? *Journal of Occupational Medicine* 1992; 34(9):934-9.
- Severson HH, Andrews JA, Lichtenstein E, Wall M, Zoref L. Predictors of smoking during and after pregnancy: a survey of mothers of newborns. *Preventive Medicine* 1995;24(1):23-8.
- Sexton M, Hebel JR. A clinical trial of change in maternal smoking and its effect on birth weight. *Journal of the American Medical Association* 1984;251(7): 911-5.
- Sexton M, Hebel JR, Fox NL. Postpartum smoking. In: Rosenberg MJ, editor. *Smoking and Reproductive Health*. Littleton (MA): PSG Publishing, 1987:222-6.
- Shaw CR. The perimenopausal hot flash: epidemiology, physiology, and treatment. *Nurse Practitioner* 1997;22(3):55-6, 61-6.
- Shiffman S. Relapse following smoking cessation: a situational analysis. *Journal of Consulting and Clinical Psychology* 1982;50(1):71-86.
- Shopland DR, Hartman AM, Repace JL, Lynn WR. Smoking behavior, workplace policies, and public opinion regarding smoking restrictions in Maryland. *Maryland Medical Journal* 1995;44(2):99-104.
- Simpkins VL. *Contemporary Issues: Tune In to Well-Being, Say No to Drugs*. New York: Girls Scouts of the United States of America, 1985.
- Simpson WJ. A preliminary report on cigarette smoking and the incidence of prematurity. *American Journal of Obstetrics and Gynecology* 1957;73(4):808-15.
- Sloss EM, Frerichs RR. Smoking and menstrual disorders. *International Journal of Epidemiology* 1983; 12(1):107-9.
- Slotkin TA. Fetal nicotine or cocaine exposure: which one is worse? *Journal of Pharmacology and Experimental Therapeutics* 1998;285(3):931-45.
- Smith NF, Migneault JP, Pirillo P, Pallonen UE, Prokhorov A, Prochaska JO. Anti-smoking programs that voc. tech. students like. Poster presented at the Society of Behavioral Medicine Meeting; 1994 Apr 14; Boston.
- Solomon LJ, Flynn BS. Women who smoke. In: Orleans CT, Slade J, editors. *Nicotine Addiction: Principles and Management*. New York: Oxford University Press, 1993:339-49.
- Sorensen G, Glasgow RE, Corbett K, Topor M. Compliance with worksite nonsmoking policies: baseline results from the COMMIT study of worksites. *American Journal of Health Promotion* 1992a;7(2): 103-9.
- Sorensen G, Goldberg R, Ockene J, Klar J, Tannenbaum T, Lemeshow S. Heavy smoking among a sample of employed women. *American Journal of Preventive Medicine* 1992b;8(4):207-14.
- Sorensen G, Pechacek T, Pallonen U. Occupational and worksite norms and attitudes about smoking cessation. *American Journal of Public Health* 1986; 76(5):544-9.
- Sorensen G, Pechacek TF. Attitudes toward smoking cessation among men and women. *Journal of Behavioral Medicine* 1987;10(2):129-37.
- Sorensen G, Thompson B, Glanz K, Feng Z, Kinne S, DiClemente C, Emmons K, Heimendinger J, Probart C, Lichtenstein E. Work site-based cancer prevention: primary results from the Working Well Trial. *American Journal of Public Health* 1996;86(7): 939-47.
- Spangler JG, Bell RA, Dignan MB, Michielutte R. Prevalence and predictors of tobacco use among Lumbee Indian women in Robeson County, North Carolina. *Journal of Community Health* 1997;22(2): 115-25.
- Spangler JG, Bell RA, Knick S, Michielutte R, Dignan MB, Summerson JH. Church-related correlates of tobacco use among Lumbee Indians in North Carolina. *Ethnicity and Disease* 1998;8(1):73-80.
- Spolar C. Park Service bans tobacco sponsors: last tennis tourney for Virginia Slims. *Washington Post* 1991 Aug 16;Sect C:6 (col 1).
- Spring B, Pingitore R, Kessler K. Strategies to minimize weight gain after smoking cessation: psychological [sic] and pharmacological intervention with specific reference to dexfenfluramine. *International Journal of Obesity* 1992;16(Suppl 3):S19-S23.
- Spring B, Wurtman J, Gleason R, Wurtman R, Kessler K. Weight gain and withdrawal symptoms after smoking cessation: a preventive intervention using d-fenfluramine. *Health Psychology* 1991; 10(3):216-23.
- St. Pierre RW, Shute RE, Jaycox S. Youth helping youth: a behavioral approach to the self-control of smoking. *Health Education* 1983;14(1):28-31.
- Steenkamp HJ, Jooste PL, Jordaan PCJ, Swanepoel ASP, Rossouw JE. Changes in smoking during a community-based cardiovascular disease intervention programme: the Coronary Risk Factor Study. *South African Medical Journal* 1991;79(5):250-3.
- Steimle S. New EU report: more women are smoking. *Journal of the National Cancer Institute* 1999;91(3): 212-3.
- Steinberg JL, Cherek DR. Menstrual cycle and cigarette smoking behavior. *Addictive Behaviors* 1989; 14(2):173-9.

- Stillman FA, Becker DM, Swank RT, Hantula D, Moses H, Glantz S, Waranch HR. Ending smoking at the Johns Hopkins Medical Institutions. *Journal of the American Medical Association* 1990;264(12):1565-9.
- Strategic Coalition of Girls and Women United Against Tobacco. Strategic Coalition of Girls and Women United Against Tobacco [fact sheet]. Alexandria (VA): American Medical Women's Association, 1995.
- Streater JAJr, Sargent RG, Ward DS. A study of factors associated with weight change in women who attempt smoking cessation. *Addictive Behaviors* 1989;14(5):523-30.
- Strecher VJ, Kreuter M, Den Boer D-J, Kobrin S, Hospers HJ, Skinner CS. The effects of computer-tailored smoking cessation messages in family practice settings. *Journal of Family Practice* 1994;39(3):262-70.
- Strouse R, Hall J. *Robert Wood Johnson Foundation Youth Access Survey: Results of a National Household Survey to Assess Public Attitudes About Policy Alternatives for Limiting Minor's Access to Tobacco Products*. Princeton (NJ): Mathematica Policy Research, 1994. MPR Reference No. 8236.
- Sussman S, Dent CW, Burton D, Stacy AW, Flay BR. *Developing School-Based Tobacco Use Prevention and Cessation Programs*. Thousand Oaks (CA): Sage Publications, 1995.
- Sussman S, Dent CW, Nezami E, Stacy AW, Burton D, Flay BR. Reasons for quitting and smoking temptation among adolescent smokers: gender differences. *Substance Use and Misuse* 1998a;33(14):2703-20.
- Sussman S, Dent CW, Severson H, Burton D, Flay BR. Self-initiated quitting among adolescent smokers. *Preventive Medicine* 1998b;27(5 Pt 3):A19-A28.
- Sussman S, Dent CW, Stacy AW, Sun P, Craig S, Simon TR, Burton D, Flay BR. Project Towards No Tobacco Use: 1-year behavior outcomes. *American Journal of Public Health* 1993;83(9):1245-50.
- Sutherland G, Stapleton JA, Russell MAH, Jarvis MJ, Hajek P, Belcher M, Feyerabend C. Randomized controlled trial of nasal nicotine spray in smoking cessation. *Lancet* 1992;340(8815):324-9.
- Svikis DS, Hatsukami DK, Hughes JR, Carroll KM, Pickens RW. Sex differences in tobacco withdrawal syndrome. *Addictive Behaviors* 1986;11(4):459-62.
- Swan GE, Denk CE. Dynamic models for the maintenance of smoking cessation: event history analysis of late relapse. *Journal of Behavioral Medicine* 1987;10(6):527-54.
- Swedish Nurses Against Tobacco. *Nurses! Organize Networks Against Tobacco*. Huddinge (Sweden): Huddinge University Hospital, 1994.
- Tang JL, Law M, Wald N. How effective is nicotine replacement therapy in helping people to stop smoking? *British Medical Journal* 1994;308(6920):21-6.
- Thompson B, Emmons K, Abrams D, Ockene JK, Feng Z. ETS exposure in the workplace: perceptions and reactions by employees in 114 work sites. [published erratum in *Journal of Occupational and Environmental Medicine* 1995;37(12):1363]. *Journal of Occupational and Environmental Medicine* 1995;37(9):1086-92.
- Thompson B, Rich LE, Lynn WR, Shields R, Corle DK for the COMMIT Research Group. A voluntary smokers' registry: characteristics of joiners and non-joiners in the Community Intervention Trial for Smoking Cessation (COMMIT). *American Journal of Public Health* 1998;88(1):100-3.
- Thornton A, Lee P, Fry J. Differences between smokers, ex-smokers, passive smokers and non-smokers. *Journal of Clinical Epidemiology* 1994;47(10):1143-62.
- Tobacco Control*. Eighth World Conference on Tobacco or Health. Buenos Aires, Argentina, 30 March-3 April 1992. Conference resolutions: international support. *Tobacco Control* 1992;1(2):91-2.
- Tomar SL, Husten CG, Manley MW. Do dentists and physicians advise tobacco users to quit? *Journal of the American Dental Association* 1996;127(2):259-65.
- Tønnesen P, Nørregaard J, Mikkelsen K, Jørgensen S, Nilsson F. A double-blind trial of a nicotine inhaler for smoking cessation. *Journal of the American Medical Association* 1993;269(10):1268-71.
- Tønnesen P, Nørregaard J, Simonsen K, Säwe U. A double-blind trial of a 16-hour transdermal nicotine patch in smoking cessation. *New England Journal of Medicine* 1991;325(5):311-5.
- Townsend JL. Cigarette tax, economic welfare and social class patterns of smoking. *Applied Economics* 1987;19(3):355-65.
- Townsend J, Roderick P, Cooper J. Cigarette smoking by socioeconomic group, sex, and age: effects of price, income, and health publicity. *British Medical Journal* 1994;309(6959):923-7.
- Transdermal Nicotine Study Group. Transdermal nicotine for smoking cessation: six-month results from two multicenter controlled clinical trials. *Journal of the American Medical Association* 1991;266(22):3133-8.

- U.S. Department of Commerce. *1990 Census of Population: Social and Economic Characteristics. United States*. Washington: U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census, 1993. 1990 CP-2-1.
- U.S. Department of Health and Human Services. *The Health Consequences of Smoking for Women. A Report of the Surgeon General*. Washington: U.S. Department of Health and Human Services, Public Health Service, Office of the Assistant Secretary for Health, Office on Smoking and Health, 1980.
- U.S. Department of Health and Human Services. *The Health Consequences of Smoking: Chronic Obstructive Lung Disease. A Report of the Surgeon General*. U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health, 1984. DHHS Publication No. (PHS) 84-50205.
- U.S. Department of Health and Human Services. *The Health Consequences of Smoking: Cancer and Chronic Lung Disease in the Workplace. A Report of the Surgeon General*. U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health, 1985. DHHS Publication No. (PHS) 85-50207.
- U.S. Department of Health and Human Services. *The Health Consequences of Smoking: Nicotine Addiction. A Report of the Surgeon General*. Atlanta: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Health Promotion and Education, Office on Smoking and Health, 1988. DHHS Publication No. (CDC) 88-8406.
- U.S. Department of Health and Human Services. *Reducing the Health Consequences of Smoking: 25 Years of Progress. A Report of the Surgeon General*. Rockville (MD): U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1989. DHHS Publication No. (CDC) 89-8411.
- U.S. Department of Health and Human Services. *The Health Benefits of Smoking Cessation. A Report of the Surgeon General*. Atlanta: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1990. DHHS Publication No. (CDC) 90-8416.
- U.S. Department of Health and Human Services. *Healthy People 2000. National Health Promotion and Disease Prevention Objectives*. U.S. Department of Health and Human Services, Public Health Service, 1991a. DHHS Publication No. (PHS) 91-50212.
- U.S. Department of Health and Human Services. *Strategies to Control Tobacco Use in the United States: a Blueprint for Public Health Action in the 1990s*. Bethesda (MD): U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Cancer Institute, 1991b. NIH Publication No. 92-3316.
- U.S. Department of Health and Human Services. *1992 National Survey of Worksite Health Promotion Activities: Final Report*. U.S. Department of Health and Human Services, Public Health Service, Office of the Assistant Secretary for Health, Office of Disease Prevention and Health Promotion, 1993a. NTIS Publication No. PB93-500023.
- U.S. Department of Health and Human Services. 1992 National Survey of Worksite Health Promotion Activities: summary. *American Journal of Health Promotion* 1993b;7(6):452-64.
- U.S. Department of Health and Human Services. *Rompa con el Vicio: Una Guía para Dejar de Fumar*. Washington: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Cancer Institute, Programa Latino para Dejar de Fumar de San Francisco, 1993c. NIH Publication No. 94-3001.
- U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Young People. A Report of the Surgeon General*. Atlanta: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1994.
- U.S. Department of Health and Human Services. *The President's Council on Physical Fitness and Sports Report. Physical Activity & Sport in the Lives of Young Girls: Physical & Mental Health Dimensions from an Interdisciplinary Approach*. Washington: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, 1997.
- U.S. Department of Health and Human Services. *Tobacco Use Among U.S. Racial/Ethnic Minority Groups—African Americans, American Indians and Alaska Natives, Asian Americans and Pacific Islanders, and Hispanics. A Report of the Surgeon General*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1998.

- U.S. Department of Health and Human Services. *Reducing Tobacco Use. A Report of the Surgeon General*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2000.
- Valois RF, Adams KG, Kammermann SK. One-year evaluation results from CableQuit: a community cable television smoking cessation pilot program. *Journal of Behavioral Medicine* 1996;19(5):479-99.
- Vander Martin R, Cummings SR, Coates TJ. Ethnicity and smoking: differences in white, black, Hispanic, and Asian medical patients who smoke. *American Journal of Preventive Medicine* 1990;6(4):194-9.
- Vartiainen E, Paavola M, McAlister A, Puska P. Fifteen-year follow-up of smoking prevention effects in the North Karelia Youth Project. *American Journal of Public Health* 1998;88(1):81-5.
- Vartiainen E, Pallonen U, McAlister AL, Puska P. Eight-year follow-up results of an adolescent smoking prevention program: the North Karelia Youth Project. *American Journal of Public Health* 1990;80(1):78-9.
- Velicer WF, Prochaska JO, Bellis JM, DiClemente CC, Rossi JS, Fava JL, Steiger JH. An expert system intervention for smoking cessation. *Addictive Behaviors* 1993;18(3):269-90.
- Vetter NJ, Ford D. Smoking prevention among people aged 60 and over: a randomized controlled trial. *Age and Ageing* 1990;19(3):164-8
- Villarosa L. Caution: tobacco ads may be hazardous to your editorial freedom. *Harvard Public Health Review* 1991;2(3):18-21.
- Voorhees CC, Stillman FA, Swank RT, Heagerty PJ, Levine DM, Becker DM. Heart, body, and soul: impact of church-based smoking cessation interventions on readiness to quit. *Preventive Medicine* 1996;25(3):277-85.
- Wagner EH, Schoenbach VI, Orleans CT, Grothaus LC, Saunders KW, Curry S, Pearson DC. Participation in a smoking cessation program: a population-based perspective. *American Journal of Preventive Medicine* 1990;6(5):258-66.
- Waldron I. Patterns and causes of gender differences in smoking. *Social Science and Medicine* 1991;32(9):989-1005.
- Wall MA, Severson HH, Andrews JA, Lichtenstein E, Zoref L. Pediatric office-based smoking intervention: impact on maternal smoking and relapse. *Pediatrics* 1995;96(4):622-8.
- Walsh DC, Gordon NP. Legal approaches to smoking deterrence. *Annual Review of Public Health* 1986;7:127-49.
- Ward KD, Klesges RC, Zbikowski SM, Bliss RE, Garvey AJ. Gender differences in the outcome of an unaided smoking cessation attempt. *Addictive Behaviors* 1997;22(4):521-33.
- Warnecke RB, Flay BR, Kviz FJ, Gruder CL, Langenberg P, Crittenden KS, Mermelstein RJ, Aitken M, Wong SC, Cook TD. Characteristics of participants in a televised smoking cessation intervention. *Preventive Medicine* 1991;20(3):389-403.
- Warnecke RB, Langenberg P, Wong SC, Flay BR, Cook TD. The second Chicago televised smoking cessation program: a 24-month follow-up. *American Journal of Public Health* 1992;82(6):835-40.
- Warner KE. State legislation on smoking and health: a comparison of two policies. *Policy Sciences* 1981;13:139-52.
- Warner KE, Goldenhar LM, McLaughlin CG. Cigarette advertising and magazine coverage of the hazards of smoking: a statistical analysis. *New England Journal of Medicine* 1992;326(5):305-9.
- Wasserman J, Manning WG, Newhouse JP, Winkler JD. The effects of excise taxes and regulations on cigarette smoking. *Journal of Health Economics* 1991;10(1):43-64.
- Watts J. Industry's voluntary tobacco-advertising ban to be tightened in Japan. *Lancet* 1998;351(9102):579.
- Weissman W, Glasgow R, Biglan A, Lichtenstein E. Development and preliminary evaluation of a cessation program for adolescent smokers. *Psychology of Addictive Behaviors* 1987;1(2):84-91.
- Wetter D, Kenford SL, Smith SS, Fiore MC, Jorenby DE, Baker TB. Gender differences in smoking cessation. *Journal of Consulting and Clinical Psychology* 1999a;67(4):555-62.
- Wetter DW, Fiore MC, Young TB, McClure JB, de Moor CA, Baker T. Gender differences in response to nicotine replacement therapy: objective and subjective indexes of tobacco withdrawal. *Experimental and Clinical Psychopharmacology* 1999b;7(2):135-44.
- Whitlock EP, Vogt TM, Hollis JF, Lichtenstein E. Does gender affect response to a brief clinic-based smoking intervention? *American Journal of Preventive Medicine* 1997;13(3):159-66.
- Willemsen MC, De Zwart WM. The effectiveness of policy and health education strategies for reducing adolescent smoking: a review of the evidence. *Journal of Adolescence* 1999;22(5):587-99.

- Wilson JJ. Summary of the Attorneys General Master Tobacco Settlement Agreement, March 1999; <<http://www.ncsl.org/statefed/tmsasumm.htm>>; accessed: December 14, 1999.
- Windham GC, Elkin EP, Swan SH, Waller KO, Fenster L. Cigarette smoking and effects on menstrual function. *Obstetrics and Gynecology* 1999;93(1): 59-65.
- Windsor RA, Boyd NR, Orleans CT. A meta-evaluation of smoking cessation intervention research among pregnant women: improving the science and art. *Health Education Research* 1998; 13(3):419-38.
- Windsor RA, Cutter G, Morris J, Reese Y, Manzella B, Bartlett EE, Samuelson C, Spanos D. The effectiveness of smoking cessation methods for smokers in public health maternity clinics: a randomized trial. *American Journal of Public Health* 1985;75(12): 1389-92.
- Windsor RA, Li CQ, Lowe JB, Perkins LL, Ershoff D, Glynn T. The dissemination of smoking cessation methods for pregnant women: achieving the year 2000 objectives. *American Journal of Public Health* 1993a;83(2):173-8.
- Windsor RA, Lowe JB, Perkins LL, Smith-Yoder D, Artz L, Crawford M, Amburgy K, Boyd NR Jr. Health education for pregnant smokers: its behavioral impact and cost benefit. *American Journal of Public Health* 1993b;83(2):201-6.
- Winkleby MA, Feldman HA, Murray DM. Joint analysis of three U.S. community intervention trials for reduction of cardiovascular disease risk. *Journal of Clinical Epidemiology* 1997;50(6):645-58.
- Winkleby MA, Fortmann SP, Rockhill B. Trends in cardiovascular disease risk factors by educational level: the Stanford Five-City Project. *Preventive Medicine* 1992;21(5):592-601.
- Women And Girls Against Tobacco. Women And Girls Against Tobacco mission statement. Berkeley (CA): Western Consortium for Public Health, Women And Girls Against Tobacco, 1993.
- Women vs. Smoking Network. Mobilizing the women's community. Grant proposal prepared by the Women vs. Smoking Network. Washington: Advocacy Institute, 1990.
- Women's Health Initiative Protocol for Clinical Trial and Observational Study Components. Seattle (WA): Fred Hutchinson Cancer Research Center, 1998.
- Wood C, Larsen L, Williams R. Social and psychological factors in relation to premenstrual tension and menstrual pain. *Australian and New Zealand Journal of Obstetrics and Gynaecology* 1979;19(2):111-5.
- Woodby LL, Windsor RA, Synder SW, Kohler CL, DiClemente CC. Predictors of smoking cessation during pregnancy. *Addiction* 1999;94(2):283-92.
- Worden JK, Flynn BS, Solomon LJ, Secker-Walker RH, Badger GJ, Carpenter JH. Using mass media to prevent cigarette smoking among adolescent girls. *Health Education Quarterly* 1996;23(4):453-68.
- World Health Organization. "Kobe Declaration" Calls for a Halt to the Tobacco Menace Among Women and Children [press release], Nov 18, 1999a; <<http://www.who.int/inf-pr-1999/en/pr99-71.html>>; accessed: September 12, 2000.
- World Health Organization. WHO International Conference on Tobacco and Health, Kobe. "Making a Difference to Tobacco and Health: Avoiding the Tobacco Epidemic in Women and Youth." Kobe, Japan, Nov 14-18, 1999b; <<http://tobacco.who.int/en/fctc/kobe/kobereport.asp>>; accessed: September 6, 2000.
- World Smoking and Health. Herstories. *World Smoking and Health* 1994;19(2):2-16.
- Yankelovich Partners. *Smoking Cessation Study*. Report prepared for Ketchum Public Relations and their client American Lung Association. Norwalk (CT): Yankelovich Partners, July 27, 1998; <<http://www.lungusa.org/partner/yank/1.html>>; accessed: August 15, 2000.
- Zelman DC, Brandon TH, Jorenby DE, Baker TB. Measures of affect and nicotine dependence predict differential response to smoking cessation treatments. *Journal of Consulting and Clinical Psychology* 1992;60(6):943-52.
- Zhu S-H, Melcer T, Sun J, Rosbrook B, Pierce JP. Smoking cessation with and without assistance: a population-based analysis. *American Journal of Preventive Medicine* 2000;18(4):305-11.