3 Smoking and Smoking Cessation

Recent Advances in Smoking and Smoking Cessation

Cigarette smoking exacts an enormous toll on our society. The statistics are at once familiar and alarming: Each year, cigarettes rob smokers of approximately 5 million years of potential life (1, 2) and directly necessitate the expenditure of about $50 billion for medical care (3). Cigarette smoking accounts for more than 400,000 deaths in this country each year (1), which means that smoking is responsible for one fifth of all deaths in the United States and that more than 1,100 smoking-attributable deaths occur in this country each day.

The public health benefits of eradicating the use of tobacco in the United States are enormous. Recognition of this fact has led an increasing number of researchers from diverse disciplines to address smoking and smoking cessation. Although much remains to be learned about these topics, significant advances continue to be made. This Recent Advances section presents a brief overview of recent research on the epidemiology of smoking, the adverse health effects of both smoking and exposure to environmental tobacco smoke (ETS), and cessation of smoking. Recent developments in the public policy arena are also examined briefly.

Epidemiology of Smoking

The 1992 National Health Interview Survey–Health Promotion and Disease Prevention supplement (NHIS-HPDP) is the most recent national survey of smoking prevalence for which complete data have been published (4). The definition of “current smoker” used to evaluate the results of the 1992 NHIS-HPDP was slightly expanded from that used in previous years to include those respondents who said they smoked cigarettes on “some days,” as well as those who claimed to smoke every day. This expanded definition will be adopted as the standard for all subsequent surveys.

The 1992 NHIS-HPDP revealed that 26.5% of all adults in the United States, some 48 million Americans, were current smokers. Smoking prevalence increased by .9% between 1991 and 1992, but this increase was entirely attributable to the expansion in the definition of current smoking elimination of “some day” smokers from analysis yields a smoking prevalence estimate of 25.6%, exactly the same as that observed in 1991 (5).
The prevalence of smoking in 1992 was slightly higher among males (28.6%) than among females (24.6%). Smoking was most common among those aged 25-44 years (30.8%) and least likely in those aged 65 years and older (14%). Smoking was most prevalent among Native Americans and Alaskan Natives (39.4%) and least prevalent among Asians and Pacific Islanders (15.2%), with blacks (27.8%), whites (27.2%), and Hispanics (20.7%) showing intermediate rates. The prevalence of smoking decreased as years of education increased and was highest among those living below the poverty level.

That smoking prevalence remained constant between 1991 and 1992, when comparable definitions of smoking are used, is cause for concern. Between 1965 and 1990, the prevalence of cigarette smoking among adults in the United States declined each year at an average rate of approximately .7% (4). In 1991, smoking prevalence failed to decline for the first time, remaining at 25.6%. The 1992 survey data indicate that this was not simply a statistical anomaly, but rather a true leveling off of smoking rates among adults in this country. This finding suggests that efforts to control smoking must be intensified if further decreases in smoking are to be achieved.

Of course, an examination of smoking patterns among adults presents an incomplete picture of the use of cigarettes in this country. The 1994 Surgeon General's Report (6) reviewed a number of surveys of cigarette smoking among youth. This report concluded that 13% to 16% of persons aged 12-18 years, at least 3.1 million youths, are current smokers. Among those aged 17-18 years, the prevalence of smoking is approximately 25%, very similar to that observed for the entire adult population (4). Because most adult smokers begin smoking daily during adolescence (6), and because few individuals who emerge from adolescence as non-smokers will go on to initiate smoking in adulthood (7), youth-oriented programs for tobacco control may be the key to attaining the goal of a smoke-free society (6, 7).

Adverse Health Effects of Smoking and Smoke Exposure

Cigarette smoking is a leading cause of pulmonary disease, cardiovascular disease, cancer, and stroke and is implicated in many other conditions (8). Recent research has confirmed the relationship between smoking and these maladies and continues to uncover links between smoking and disease.

Pulmonary Disease and Pulmonary Function

Research continues to shed light on the connections between smoking and both pulmonary disease and pulmonary function. Because many pages in this volume are devoted to consideration of this work, only 2 particularly interesting studies will be mentioned here. Shahar and colleagues (9) used measures of dietary intake of fish, the primary dietary source of n-3 fatty acids, to examine whether these compounds moderate smokers' risk of chronic obstructive pulmonary disease (COPD).

These authors found that smokers' rates of COPD were associated with a decreased risk of COPD, suggesting that these compounds may be protective.

An interesting report by Islam and colleagues (10) describes a change in ventilatory function among individuals with chronic bronchitis who stopped smoking. The volume in 1 second in individuals with chronic bronchitis was a striking finding, even after controlling for the presence of other significant risk factors. These authors also replicated smoking and lung cancer.

Other Disorders

A host of nonpulmonary adverse effects of smoking have received attention in the past year. Studies examining the relationship between smoking and disease continue to be published (11). Use of tobacco during pregnancy results in diminished efficacy of radiation therapy (12), and the progression of breast cancer (13), and the progression of breast cancer (14), as well as increased risk of stroke (15), and increased risk of spontaneous abortion (16), has been associated with smoking.

Other recent studies have reported a link between smoking and disease. For example, smoking is associated with an increased risk of functional ovarian cysts (17), breast cancer (18), and the progression of diminished efficacy of radiation therapy (19), the progression of breast cancer (20), and the progression of breast cancer (21). Finally, a study published in the Journal of the American Medical Association (JAMA) (22), showed that the prevalence of COPD was lower in individuals who had never smoked compared to those who had ever smoked. It is unclear whether these findings are due to the protective effects of smoking or the effects of the presence of other risk factors.

Health Effects of Prenatal and Environmental Tobacco Smoke

In recent years, researchers have investigated the effects of smoking on the health of infants and children. The recent effort to classify ETS as a cause of lung cancer in women, especially during the critical period of development, has led to decreased birth weight (23), increased risk of sudden infant death syndrome (SIDS) (24), and impaired cognitive development (25). Evidence of the puerperal effect in high-risk pregnancies has been reported (26), and the risk of respiratory disease in children who were exposed to ETS during pregnancy has been found to be increased (27).

Evidence of the detrimental effect of smoking on lung development in infants has been reported (28), and the risk of respiratory disease in children who were exposed to ETS during pregnancy has been found to be increased (29). The risk of respiratory disease in children who were exposed to ETS during pregnancy has been found to be increased (30). Evidence of the puerperal effect in high-risk pregnancies has been reported (31), and the risk of respiratory disease in children who were exposed to ETS during pregnancy has been found to be increased (32).
These authors found that smokers’ intake of n-3 fatty acids was associated with a decreased risk of COPD in a dose-dependent manner, suggesting that these compounds may serve a protective function.

An interesting report by Islam and Schottenfeld (10) suggests that changes in ventilatory function among smokers may have prognostic significance. These authors found that rapidly declining forced expiratory volume in 1 second in individuals who smoke and have persistent symptoms of chronic bronchitis was a strong predictor of eventual lung cancer, even after controlling for a number of potential confounding variables. These authors also replicated the well-known link between smoking and lung cancer.

**Other Disorders**

A host of nonpulmonary adverse health effects of smoking have received attention in the past year. Studies replicating well-known links between smoking and disease continue to appear. For instance, recent reports have found smoking to be associated with an increased risk of coronary heart disease (11), colorectal cancer (12), colorectal adenoma (13), and thickening of the carotid artery wall (14).

Other recent studies have reported new associations between smoking and disease. For example, smoking has been shown to be related to the incidence of functional ovarian cysts (15), the probability of dying of breast cancer (16), the progression of diabetic nephropathy (17), and the diminished efficacy of radiation treatment for cancers of the head and neck (18). Finally, a study published in 1994 (13) reported the first evidence of an association between smoking and colorectal cancer in women.

**Health Effects of Prenatal and Environmental Tobacco Smoke Exposure**

In recent years, researchers have increasingly become aware of the fact that smokers are not the only ones who suffer the adverse health effects of cigarette smoking. The recent decision of the Environmental Protection Agency (19) to classify ETS as a group A carcinogen is both a direct outgrowth and a powerful confirmation of this burgeoning awareness.

Several studies examining the health consequences of prenatal exposure to tobacco smoke have appeared in the past year. Smoking by pregnant women, especially during the third trimester (20), has been associated with decreased birth weight (20, 21). Children of mothers who smoke during pregnancy also appear to be at an increased risk for obstructive sleep apnea (22), impaired lung function (23), and lower intelligence quotient scores (24), compared with children of mothers who abstain from cigarettes during pregnancy.

Evidence of the pernicious effect of ETS continues to mount. Fontham et al. (Abstract 137-95-3-14) recently reported the results of a large-scale, multicenter study designed to assess the relative risk of lung cancer in women who never smoked associated with exposure to ETS. Results showed that exposure to ETS was indeed associated with an in-
creased risk of lung cancer. The relative risk increased with duration of exposure; those individuals with the highest level of lifetime exposure to ETS were more than 3 times as likely to have lung cancer compared with those who had no exposure.

Exposure to ETS is associated with other negative outcomes as well. For instance, recent reports found that exposure to ETS leads to impaired pulmonary function in children (25) and provokes the exacerbation of asthma in children in a dose-dependent fashion (26). Another study found that, in adults, exposure to ETS is associated with increased carotid artery wall thickness (14).

SMOKING CESSATION

A recent Gallup poll (27) found that approximately 70% of smokers believe they will be able to give up smoking if they decide to do so. Sadly, available epidemiologic data suggest that they are mistaken; the vast majority of smokers who attempt to quit fail to maintain long-term abstinence from cigarettes. Results of the most recent national survey of smoking cessation (28) indicated that, of those smokers who quit for at least 1 day during 1991 (42.1%), only 13.8% maintained abstinence for 1 month or more. If the analysis is restricted to those respondents who reported smoking daily at the beginning of the study period, the estimate is lowered; only 9.7% of daily smokers who quit for 1 day remained abstinent for at least 1 month. Of course, even this figure overestimates the true rate of smoking cessation, because many smokers relapse after 1 month of abstinence.

Despite these rather dismal cessation rates, nearly 70% of smokers report that they want to quit (27). It is the responsibility of physicians and other health care providers to take advantage of and continue to foster this high level of motivation among smokers by advising every patient who smokes to quit. Regrettably, health care providers are a long way from meeting this responsibility; fewer than 40% of smokers visiting outpatient facilities receive advice to quit (29).

Nicotine replacement therapy has been demonstrated to be an effective strategy for smoking intervention. Several meta-analyses (30-33) examining the efficacy of various nicotine replacement treatments have been published in the past year. These meta-analyses demonstrated that nicotine gum (30, 31), the nicotine patch (30-32), nicotine nasal spray (31), and the nicotine inhaler (31) are all effective aids to smoking cessation. Of these delivery systems, only the gum and patch are currently available through prescription in the United States. Because the efficacy of the gum appears to depend on the intensity of adjuvant counseling (33), and because gum use is associated with a number of unpleasant side effects that reduce compliance (30), the nicotine patch has become the most widely used pharmacologic treatment for smoking cessation.

One meta-analysis of the efficacy of the nicotine patch found that users of the patch were 3 times more likely than users of a placebo patch to be abstinent after 6 months (32). This study also found that, in contrast to findings in the literature, consistently outperformed placebo amount of adjuvant behavioral co- ing was found to be an independent clinical trials of the nicotine patch- ing generally produced the h showed that extending the duration of as many patch manufacturers rec- efficacy.

Although the nicotine patch is for smokers who want to quit, phy not a stand-alone “cure” for smoking. the nicotine patch, only 22% of after 6 months (32).

These findings highlight the fact that a chronic disease, marked by persistent, physicians who help their patients follow them early and often after Kenford et al. (Abstract 137-95-3) noted during the first 2 weeks of an relapse to smoking by 6 months, this period may be particularly

SMOKING AND PUBLIC POLICY

The recent announcement of (FDA) that it would consider regulated products as drugs represents the tobacco industry in many years (34) was fueled by media reports that extract nicotine from tobacco plants, then treat reconstituted it to precisely manipulate its nicotine nearly every consumable commodity, not exercised regulatory control over they were considered to be neither drugs are substances that are inten- of the body. Although it has long structure and function of the body, ration because it has been difficult for them to do so. The revelation that nicotine strongly suggests such intent, act as and other tobacco products, these products squarely within the
The relative risk increased with duration of ETS exposure, with the highest level of lifetime exposure to ETS being associated with the greatest risk of lung cancer (10). In addition, exposure to ETS has been linked to other negative outcomes as well. Some studies suggest that exposure to ETS leads to impaired lung function in children (25), and it is associated with a dose-dependent increase in the risk of various respiratory conditions (26). Another study found a dose-response relationship between exposure to ETS and increased risk of lung cancer (27).

It has been found that approximately 70% of smokers who attempt to quit smoking if they decide to do so, will fail to maintain long-term cessation rates. These attempts often fail due to the high rate of relapse (28), as only 13.8% of smokers who quit for at least 1 year maintained abstinence for 1 year, and of those smokers who quit for at least 1 year, only 3.7% remained abstinent for 1 year (29). Studies have also shown that the majority of relapse occurs within the first 6 months after quitting (30).

This highlights the importance of offering support and resources to aid in smoking cessation. It is the responsibility of physicians and other health care providers to advise and support their patients in their efforts to quit smoking. This support can include strategies such as nicotine replacement therapies, counseling, and referral to smoking cessation programs (31).

Nicotine replacement therapies, such as nicotine gum (32) and nicotine patches (33), have shown to be effective in helping smokers quit. Nicotine gum is a popular choice due to its portability and ease of use. Nicotine patches provide a consistent delivery of nicotine over a period of time, which can help reduce cravings and withdrawal symptoms (34). The recent regulations by the Food and Drug Administration (FDA) now require that all products containing nicotine, like cigarettes and other tobacco products, carry health warnings (35).

In conclusion, while smoking is a complex and multifaceted issue, the evidence suggests that tobacco is not just a habit or addiction, but a disease. The history of tobacco use and addiction is marked by a cycle of innovation and resistance, where tobacco industries have adapted to regulations and public health campaigns by developing new products and marketing strategies (36). This highlights the challenge in the fight against tobacco use and the need for continued research and public health efforts.
signs of nicotine addiction) to estimate a hypothetically threshold of daily nicotine intake required to establish nicotine addiction. The authors concluded that this threshold level is about 5 mg of nicotine per day. To prevent the growth of nicotine addiction in future generations, they propose mandating that the nicotine content of cigarettes be set at a level at which the addiction threshold could not be exceeded, even if fledgling smokers smoked 20-30 cigarettes per day. Thus, these authors propose that the nicotine content of cigarettes should not be allowed to exceed .4 mg (average American cigarettes currently contain 8-9 mg of nicotine). Benowitz and Henningfield are in favor of introducing restrictions on nicotine content gradually over a period of years to allow the millions of Americans who are currently addicted to cigarettes to wean themselves off nicotine without undue discomfort.

Because major changes in tobacco industry regulation are clearly on the horizon, it is an exciting period for those involved in the war against tobacco. Intensification of the federal regulation of tobacco products is a critical ingredient in the achievement of the most important public health goal of our time—the creation of a smoke-free society.

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References