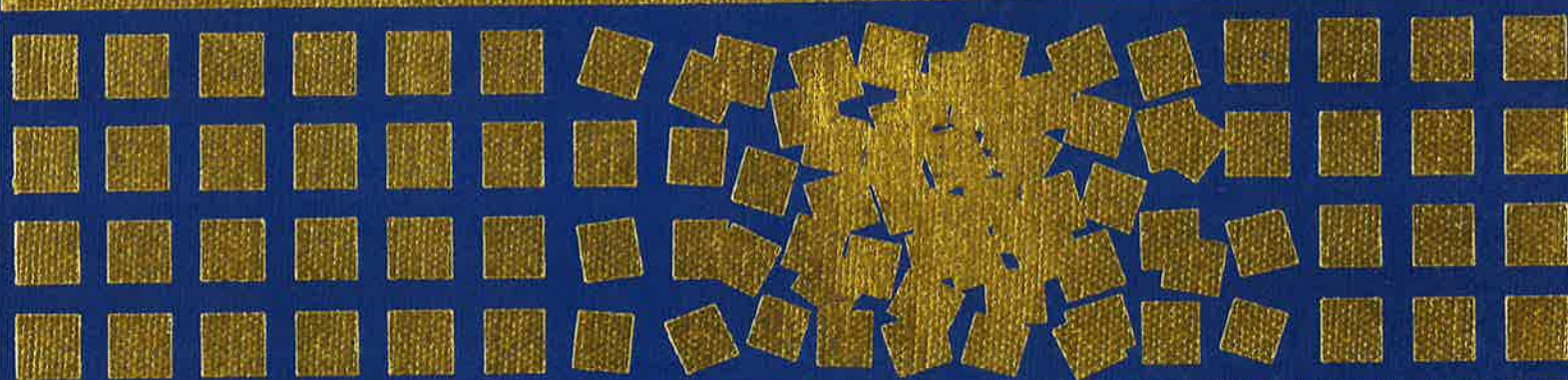


CANCER

Principles & Practice of Oncology



5th Edition

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THE STUDY OF
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CHAPTER 21

Cancer Prevention: Preventing Tobacco-Related Cancers

By all rights, lung cancer should have been included along with smallpox as one of the diseases that was eradicated in the 20th century. Instead, to the undying shame of the health professions—and due to the untiring energy of the transnational tobacco conglomerates—the production, distribution, marketing, and use of tobacco continue to grow in every corner of the world. By 1990, some 419,000 deaths in the United States (20% of all US deaths) were attributed to smoking, including more than 150,000 deaths from neoplasms.¹ Worldwide, annual deaths from smoking are expected to exceed 3 million a year by the turn of the century.²

Since US Surgeon General Leroy E. Burney issued a policy statement in 1957 that accepted the cause–effect relationship between cigarette smoking and lung cancer,³ each succeeding Surgeon General has been committed to curbing the use of tobacco. Not until August 1995, however, did the effort to end the tobacco pandemic receive active support from a sitting president of the United States. With the position of Surgeon General vacant, President Bill Clinton took over the reins as commander-in-chief of the war on tobacco by announcing that he would back the most far-reaching restrictions on the sale and promotion of tobacco products ever proposed by a US government agency. The Food and Drug Administration (FDA), directed by pediatrician David Kessler, had sought approval to regulate tobacco products and to implement a comprehensive program aimed at reducing tobacco use among young people. The proposed policies would ban cigarette vending machines, prohibit color and images from tobacco advertisements, end tobacco brand-name sponsorship of sporting events, prevent tobacco advertising near schools, and stop the distribution of tobacco promotional items such as T-shirts.

Presidential support for such measures capped a 2-year period during which a nationally televised Congressional hearing convened by Representative Henry Waxman featured a lineup of top executives of the major tobacco companies testifying under oath that they did not have reason to believe that nicotine is addictive. The publication by various newspapers of purloined internal tobacco company documents appeared to contradict such testimony. Additional revelations from two repentant former tobacco company scientists and a former tobacco lobbyist gave momentum to large class-action lawsuits brought by relatives of deceased or disabled smokers against the tobacco industry charging that the companies knowingly attempted to addict their loved ones to nicotine. Several state attorney generals also filed suit against tobacco companies seeking reimbursement for Medicaid costs generated by caring for individuals with tobacco-caused diseases. Not surprisingly, the tobacco industry fought back with a national advertising campaign accusing the government of trying to regulate personal habits and interfering with the freedom to advertise.

In 1964, the Report of the Advisory Committee to the Surgeon General on Smoking and Health reviewed and summarized the devastating scientific case against smoking.⁴ This document and an analysis produced in the United Kingdom in 1962 by the Royal College of Physicians⁵ galvanized the medical community and the public alike. The Surgeon General's report was written by 10 eminent biomedical scientists who had been selected by Surgeon General Luther Terry from a list of 150 people (none of whom had taken a public position on the subject of smoking and health) approved by major health organizations and the tobacco industry.

Concerns about smoking had long been raised in the scien-

tific community. In 1928, Lombard and Doering⁶ reported a higher incidence of smoking among patients with cancer than among controls. Ten years later, Pearl⁷ reported that persons who smoked heavily had a shorter life expectancy than those who did not smoke. In 1939, Ochsner and DeBaKey⁸ began reporting their observations on the relation between smoking and lung cancer. For many years, they and other outspoken opponents of smoking, such as Dwight Harkin, William Overholt, and William Cahan, were met with either indifference or derision within the medical profession, doubtless due to the fact that more than two thirds of physicians smoked.

Not until the epidemiologic work in the 1950s of Doll and Hill^{9,10} in the United Kingdom and Wynder and Graham¹¹ and Hammond and Horn¹² in the United States did the medical profession begin to take the problem seriously. Cigarette advertisements continued to appear in the *Journal of the American Medical Association* (among many other publications for health professionals) until 1954; one such advertisement thanked the 64,985 doctors who had visited the Viceroy cigarette exhibit at medical conventions that year. Promotional displays and free distribution of cigarettes existed at various state medical society meetings until the 1980s. In 1978, the American Medical Association (AMA) issued a report, "Tobacco and Health," which summarized research projects that confirmed the findings of the 1964 Surgeon General's report and cemented the association between smoking and heart disease.¹³ This report was entirely underwritten by the tobacco industry, which in effect had succeeded in muting any official action-oriented stance on the part of the AMA for 14 years.

Since 1985, when it first called for a prohibition on tobacco advertising, the AMA has participated in the effort to curtail the use and promotion of tobacco. After peer review by AMA lawyers, the *Journal of the American Medical Association* devoted most of its issue of July 19, 1995, to an analysis of the purloined tobacco industry documents. The AMA has helped plan two national conferences on tobacco and has made the subject of smoking and health one of its four top priorities. Pressure by the AMA and others led the Joint Commission on Accreditation of Healthcare Organizations to institute a policy mandating that accredited health facilities be smoke-free environments as of 1992. Among medical specialty societies, since the late 1970s, the American Academy of Family Physicians has helped train physicians in smoking cessation and has given financial support to antitobacco advocacy organizations such as Doctors Ought to Care (DOC).

The American Cancer Society (ACS), considering its \$390 million annual income, has been cautious and conservative in challenging the tobacco industry. Not until 1983 did the organization begin to address the subject of cigarette advertising. On the other hand, the ACS has made several major contributions, most notably adoption of the annual stop-smoking day in November known as the Great American Smokeout; cosponsorship since 1967 of world conferences on smoking and health (including the 10th such meeting in Beijing, August 1997); and financial contributions for public referenda in California, Massachusetts, and Arizona that resulted in the creation of tax-supported antitobacco agencies in those states. For the past decade, the ACS, American Lung Association, and American Heart Association have cooperated in the establishment of a Washington lobbying office, the Coalition on Smoking OR Health.

In the 1970s, to fill the void left by government agencies, public health organizations, and government agencies fearful of angering tobacco interests (e.g., in 1971, the Department of Health and Human Services failed to support Surgeon General Jesse Steinfeld's call for a Nonsmokers' Bill of Rights), a remarkable grassroots movement arose with the goal to create smoke-free public places. Groups such as Action on Smoking and Health (ASH), Group Against Smoking Pollution (GASP; in Massachusetts, New Jersey, Colorado, Georgia, and other states), Arizonans Concerned about Smoking, Californians for Non-Smokers' Rights (now Americans for Nonsmokers' Rights), and Minnesota's Association of Nonsmokers paved the way for measures such as the federal ban on smoking on airliners and local laws that restrict smoking, remove cigarette vending machines, and ban the distribution of free tobacco samples.

Although numerous prospective studies conducted over the past 40 years have documented multifarious disease risks associated with smoking,¹⁴ cancer has been linked to tobacco use for more than two centuries. In 1761, John Hill,¹⁵ a London physician, reported an association between the use of snuff and cancer of the nose. The first US Surgeon General's Report on Smoking and Health in 1964 concluded that cigarette smoking was the major cause of lung cancer in men and was causally related to laryngeal cancer and oral cancer in men.⁴ More than 60,000 subsequent studies and two dozen additional reports of the Surgeon General have documented the impact of tobacco use on morbidity and mortality in the United States and abroad.

Smoking is accepted as the major cause of cancers of the lung, larynx, oral cavity, and esophagus, and is a contributory factor in cancers of the pancreas, bladder, kidney, stomach, and uterine cervix. Overall, cigarette smoking has been identified as the chief preventable cause of deaths due to cancer in the United States.¹⁴

LUNG CANCER

The most prominent conclusion of the 1964 Surgeon General's report was the determination that cigarette smoking is the major cause of lung cancer in men.^{4,16,17} By 1990, lung cancer had displaced coronary heart disease as the leading single cause of excess mortality among persons who smoke in the United States.¹⁸ From the 1960s to 1990, death rates from lung cancer increased six-fold among women who smoke and nearly doubled among males who smoke.¹⁹ There is a clear dose-response relationship between lung cancer risk and daily cigarette consumption, and those people who smoke more than a pack of cigarettes a day have a risk that is at least 20 times that of nonsmokers.¹⁴ The four major histologic types of lung cancer—squamous cell, adenocarcinoma, small cell, and large cell—are all associated with smoking. Squamous cell cancer is the most common form among men; in women, adenocarcinoma predominates.²⁰

The identification by Wynder and Graham and other researchers of cigarette smoking as the major causative factor in the development of lung cancer led the tobacco industry to introduce and widely promote various filtered brands and cigarettes with less nicotine and "tar"; the illusion was thus created that the risk had been diminished or all but eliminated.²¹⁻²⁴

Tragically, while smoking rates in the United States have

declined by an average of 0.5% per year during the past 10 years, and while the incidence of lung cancer among African American and white men has leveled off, the incidence of lung cancer continues to rise at a rate of 5% per year among women. Moreover, early detection hardly improves survival; the 5-year survival rate has hovered at approximately 10% since the 1960s.²⁵ Despite the fact that none of the major prospective studies of lung cancer screening has found that aggressive radiography and cytology improves survival or prognosis, a recent reevaluation of randomized trials supports the recommendation of annual chest x-rays in persons who have ever smoked.²⁶

Although there is a gradual decrease in risk of death from lung cancer after cessation of cigarette smoking, this message is perceived by many of those who smoke to mean that the risk for developing lung cancer will diminish immediately on stopping. Such a misunderstanding may lead to postponement of cessation in the belief that it does not matter when one stops. At the opposite extreme are those who rationalize their habit based on anecdotal evidence of a friend who stopped smoking and died soon thereafter, a relative who smoked for 60 years and did not die of lung cancer, or an acquaintance who never smoked but still developed lung cancer. Although a diminished risk for lung cancer is experienced among former smokers after 5 years of cessation, the risk among former smokers remains higher than that of nonsmokers for as long as 25 years.²⁷ The age at the time of smoking cessation has a major impact on the subsequent risk for lung cancer, with much greater benefits accruing to those stopping at younger ages.^{28,29} Any early reduction of health risk after cessation applies primarily to heart disease,²⁷ whereby a decline in risk for heart problems appears to occur within 1 year of cessation; even then, the remaining decline in excess risk for heart disease is more gradual, approaching that of persons who have never smoked, only after many years of smoking abstinence.²⁴

When people who smoke are exposed to other carcinogens in the workplace (e.g., pipefitters and asbestos; uranium workers and radon³⁰), their risk for lung cancer is dramatically higher than those who do not smoke; moreover, the combined effects of smoking and occupational exposure to carcinogens is greater than the risk for either alone.³¹⁻³³ Although the proportion of deaths attributed to lung cancer is greater among blue-collar workers than among white-collar occupational groups, female executives, managers, technicians, sales workers, and administrative support clerical workers have significant excesses in lung cancer deaths.³⁴

Worldwide, 85% of the 676,000 annual newly diagnosed cases of lung cancer in men are attributable to cigarette smoking.³⁵ Compared with men, women smokers appear to have a higher risk of developing all cell types of lung cancer.^{36,37} As smoking continues to rise among women, the implications of this finding are ominous. The mortality rate from lung cancer in young adults is rising in central and eastern Europe, a trend that is likely to worsen as American and British tobacco companies acquire formerly state-owned cigarette enterprises and launch Western marketing techniques.^{38,39} Similar trends have been found in Latin America and Asia.⁴⁰

Although a growing understanding of the molecular genetics of smoking-related cancers may translate into improved diagnosis and treatment, the risk of such disease would still appear dependent on the extent of exposure to tobacco smoke.⁴¹

Reputable journals continue to publish the work of at least one group of researchers that believes accepted estimates of excess mortality due to tobacco fail to control for relevant confounders and reveal an attribution bias, particularly in regard to the use of death certificate data on smoking and lung cancer.^{42,43} In 1995, the American Thoracic Society announced that manuscripts resulting from investigations supported by tobacco industry funding would no longer be considered for publication in its journals, the *American Journal of Respiratory and Critical Care Medicine* and the *American Journal of Respiratory Cell and Molecular Biology*. Also in 1995, MD Anderson Cancer Center, following several years of debate, approved a proposal by radiologist Joel Dunnington to decline all research funding by the tobacco industry. Such policies are rare among American health institutions; few medical schools restrict grant applications by researchers to tobacco industry sources like the Council for Tobacco Research and the Smokeless Tobacco Research Council.⁴⁴

LARYNGEAL CANCER

Cigarette smoking is the major cause of cancer of the larynx.^{14,45} Of the estimated 12,500 new cases of laryngeal cancer in 1994 in the United States (which constituted 1% of all new cancer cases), approximately 82% were directly attributable to cigarette smoking; in a population-based case-control study in Poland, smoking accounted for 95% of all cases of laryngeal cancer.⁴⁶ Three thousand men and 800 women died from laryngeal cancer in 1994.⁴⁷ Overall, deaths from cancer of the larynx have been found to occur at a rate of at least 5.6 times greater among persons who smoked cigarettes compared to nonsmokers.⁴⁸ In three of six major prospective studies that investigated the relation between smoking and cancer of the larynx,^{14,45,49-53} mortality ratios could not be calculated because all of the deaths from laryngeal cancer occurred in people who had smoked cigarettes.⁴⁵ A similar risk for cancer of the larynx has been found among those persons who smoke cigars or pipes.⁵⁴ Thus, it is essential to explode the myth that switching to a pipe or cigars conveys a reduced risk for cancer.

Williams and Horn⁵⁵ reported a strong dose-response relation between the number of cigarettes smoked per day and the risk for developing cancer of the larynx; other reports have confirmed that people who smoke more than 25 cigarettes a day have cancer mortality ratios 20 to 30 times greater than those who do not smoke.^{14,45} There appears to be a synergistic, multiplicative effect between smoking and drinking, possibly as the result of alcohol acting as a solvent of carcinogens in tobacco smoke or as the result of an alteration in liver metabolism.⁵⁶ The risk for developing cancer of the larynx is as much as 75% higher in people who use tobacco and alcohol compared with people who are exposed to either substance alone.^{45,56} One study describes a typical patient with cancer of the larynx as a 50- to 60-year-old man who smoked cigarettes and was a moderate to heavy alcohol drinker.⁵⁷ Continued smoking after radiation therapy for cancer of the larynx has been associated with a significantly greater risk of recurrence.⁵⁸

Some researchers have turned to measurement of so-called genetic susceptibility markers for laryngeal and other cancers, such as carcinogen metabolic activation and DNA repair capability, in the hope of identifying high-risk population

smoking may increase the risk for all types of lymphoma by 1.4 to 2.8 times.

"LESS HAZARDOUS" CIGARETTES

Throughout the 20th century, cigarette advertising campaigns have tried to allay the public's concerns about smoking. One of the best known slogans throughout the 1930s and 1940s was that of Old Gold cigarettes: "Not a cough in a carload." At the same time, the American Tobacco Company claimed, "Lucky Strike is less irritating to sensitive or tender throats." Advertisements for Philip Morris cigarettes on radio and in countless magazines, newspapers, and medical journals boasted, "Every case of irritation of the nose and throat due to smoking cleared or definitely improved." RJ Reynolds' ubiquitous message was, "More doctors smoke Camels."

In the 1950s, confronted with declining cigarette sales after the publication of studies linking smoking to lung cancer, tobacco companies began producing filtertip brands that were claimed to remove certain components of the smoke, which manufacturers have never acknowledged to be harmful.²³ Brown and Williamson purchased advertising space in the medicine section of *Time* magazine to claim that Viceroy cigarettes offered "double-barrel health protection," and advertisements for Liggett and Myers' filter L & Ms claimed that they were "Just what the doctor ordered." Years later Lorillard's widely promoted Kent Micronite filter was found to have been composed of asbestos; and, in 1995, a San Francisco jury found the manufacturer liable for more than \$1 million in damages to the family of a man who smoked Kent cigarettes and developed a mesothelioma. With the creation and promotion of the filter, the tobacco industry succeeded in turning the adverse scientific findings about cigarette smoking to its advantage and became, in effect, our leading health educator: currently, 97% of those who smoke buy filtered brands. Based on the finding of cellulose acetate cigarette filter fibers in pulmonary tissue of patients with lung cancer, Pauly and colleagues⁹³ theorize that the non-biodegradable fibers are sequestered in the lung; where in combination with their adsorbed cigarette smoke-associated carcinogens they contribute to malignant transformation.

A second scientific advance—brands with purportedly lower levels of "tar" and nicotine—was promoted by tobacco companies to calm widespread fears about lung cancer following the publication in 1964 of the first Surgeon General's Report on Smoking and Health. Tar is a composite of more than 4000 separate solid products of combustion, including at least 43 known carcinogens.^{17,94} More simply, "low tar" can be translated as "low poison."⁹⁵ Cigarettes with reduced yields of tar, nicotine, and carbon monoxide are not safer. A recommendation to switch to such brands is misguided.

Nonetheless, the purported innovation of lowered tar levels in the design of the product was met with overwhelming consumer acceptance. Between 1976 and 1982, sales of low-tar cigarettes increased from 17% to 59% of total cigarette sales.²² In addition, the industry has continued to suggest health benefits to consumers through the creation and promotion of such descriptors as "lights," "ultralights," "milds," "mediums," "slims," and "superslims."

Incredibly, throughout the 1970s the ACS, the NCI, and

most major health organizations promoted the concept of a "less hazardous" cigarette in the belief that most people who smoke would not or could not stop.^{23,96} In fact, persons who switch to allegedly low-tar cigarettes have been found to employ compensatory smoking, whereby they inhale more frequently and more deeply to maintain a satisfied level of nicotine.^{22,23,94,97} Not until 1980 did the NCI drop its research effort to develop a less hazardous cigarette, choosing instead to concentrate on efforts to educate heavy smokers to stop. Only in 1995 did the FDA and Federal Trade Commission (charged with monitoring tar and nicotine ratings) recognize the problems of compensatory smoking and the fallaciousness of tar and nicotine ratings. Should these government agencies attempt to mandate a maximum level of nicotine in cigarette brands, they may well assist the tobacco industry once again in enabling consumers to rationalize their continued smoking of implicitly less addictive brands. Cigarettes that are especially low in nicotine may well facilitate smoking among adolescents.

Hoffmann and colleagues⁹⁸ continue to hold that epidemiologic studies have shown that the long-term smoker of low-yield cigarettes has a 20% to 50% lower risk of lung cancer than smokers of higher yield cigarettes. They attribute this to the introduction of filtertips, reconstituted and expanded tobaccos, and use of porous paper and perforated filtertips. They believe that there is a strong "social case" to be made for further developments in low-yield cigarettes. From an epidemiologic standpoint, Peto⁹⁹ also believes the availability of lower-tar cigarettes in developing nations would represent the lesser of two evils, compared with the very high yield products currently sold. Others observe, however, that the alleged tar yield of a brand of cigarettes is not an accurate guide to the amount of tobacco smoke components consumed by the smoker.¹⁰⁰⁻¹⁰² Moreover, changing to cigarettes with a lower tar yield is not an effective means of reducing tobacco-related morbidity from myocardial infarction. Certainly, from the manufacturer's perspective, one can safely conclude that the low-tar cigarette is the perfect enabler for the perpetuation of smoking.

In recent years, various tobacco companies have invested considerable resources in the development of cigarette prototypes in which the tobacco is not burned but instead is heated so as to provide the user with nicotine and flavor. It is suggested¹⁰³ that such products could maintain consumer satisfaction while circumventing the increasing restrictions on smoking in public places, ending concerns about the danger of tobacco smoke to the nonsmoker and reducing fires. Although there is no evidence that test marketing of such products has found even slight consumer acceptance, some investigators believe that these low-smoke prototypes are simply nicotine delivery devices that warrant regulation by the FDA.¹⁰³

WOMEN AND SMOKING

In 1964, at the time of the first Surgeon General's report discussing the smoking epidemic, lung cancer was the leading cause of death due to cancer in men and the fifth leading cause of cancer mortality among women.⁴ This difference in lung cancer mortality rates can be explained by the fact that until the 1920s, it was socially unacceptable—and in some cases illegal—for women to smoke.¹⁰⁴ Men had taken up cigarette

subgroups who could then be more intensely educated to stop smoking.⁵⁹ One potential marker is mutation in the p53 tumor suppressor gene, which was observed in approximately 60% of a series of 41 laryngeal squamous cell carcinomas.⁶⁰ Still other investigators are looking toward chemoprevention with dietary supplements such as beta carotene and vitamin E. One large study found no decrease in the incidence of laryngeal cancer among male smokers after 5 to 8 years of such therapy.⁶¹ Increasing numbers of laryngectomy patients and support organizations are outspoken in warning the public of the painful consequences of smoking. A television commercial made in 1995 for the Massachusetts Division of Tobacco Control hauntingly juxtaposes the glamorous image of the young Janet Sackman in an early 1950s advertisement for Lucky Strike cigarettes with the older, esophagus-speaking Mrs. Sackman, a laryngectomee.

ORAL CANCER

A dose-response relation exists between the number of cigarettes smoked per day and cancers of the lip, tongue, salivary gland, floor of the mouth, mesopharynx, and hypopharynx.^{14,62} The use of pipes, cigars, and spitting tobacco in its various forms (plug tobacco, loose-leaf tobacco, twist tobacco, and moist snuff) is also associated with the development of cancers of the oral cavity; the risk of using these forms is of the same magnitude as that of using cigarettes.^{14,45,63} Tobacco use is responsible for more than 90% of tumors of the oral cavity among men and 60%, among women.¹⁷

There is a 27-fold increase in the rate of oral cancer among men who smoke cigarettes, pipes, or cigars and a 6-fold increase among women who smoke.¹⁷ Spitting tobacco is a significant cause of leukoplakia,⁶³⁻⁶⁶ an abnormal thickening and keratinization of the oral mucosa that is recognized as a precursor of malignancy. Oral cancer is extremely insidious: in one study, the mean duration of symptoms in 128 patients with such advanced lesions was only 3 weeks.⁶⁷ Even with cessation of tobacco exposure, the risk of cancer of the entire epithelium of the upper aerodigestive tract remains high for years due to the "field cancerization effect."⁶⁸ Consumption of alcohol and tobacco presents both independent and combined risks for cancer on a dose-related basis.⁶⁹

OTHER CANCERS

A relationship between smoking and bladder cancer was noted in the 1964 Surgeon General's report.⁴ The 1982 Surgeon General's report concluded that cigarette smoking is a contributing factor for bladder and kidney cancer. In 1992, researchers at the National Cancer Institute (NCI) reported the results of a large population-based case-control study of cancer of the renal pelvis and ureter that confirms cigarette smoking is the major cause of these tumors, accounting for about 7 of 10 cancers of the renal pelvis and ureter among men and almost 4 of 10 among women.⁷⁰ An international, multicenter, population-based case-control study found a 40% increased risk for renal cell cancer among cigarette smokers (but no associated risk among users of other forms of tobacco).⁷¹ Forty percent of bladder cancers (or more than 4000 new cases in the United

States each year) and kidney cancer (more than 3600 cases) are believed to be smoking related.^{17,72} Occupational exposure by smokers to various dyes, paints, and organic chemicals dramatically increases the risk of bladder cancer. Although the risk of genitourinary cancer following smoking cessation has been found to remain elevated for more than 15 years,^{73,74} a recent British study found that stopping smoking led to a rapid reduction in risk for urothelial cancer.⁷⁵

Based on a questionnaire survey among 250,000 US veterans, it has been suggested that cigarette smoking may be associated with as much as a 50% increased risk for prostate cancer.⁷⁶ Men who smoke have been found to have a higher incidence of more invasive and high-grade adenocarcinoma of the prostate than nonsmokers with prostate cancer.⁷⁷ A recent study of 503 patients with penile cancer (and age-matched controls) found smoking to be a significant risk factor for this condition; use of more than one form of tobacco increased the risk.⁷⁸

The risk for nasopharyngeal carcinoma, a relatively uncommon cancer in the United States, has been found to increase in proportion to the amount and duration of cigarette use, with a more than three-fold increase among persons smoking heavily.^{79,80} A case-control study of stomach cancer in Japan suggests that cigarette smoking may play a more significant role in this condition than either alcohol consumption or family history.⁸¹ People who smoke have two to three times the risk for pancreatic cancer that nonsmokers have, and the risk is proportional to the amount smoked¹⁷; Silverman and associates⁸² estimate that elimination of cigarette smoking would eventually prevent 27% of the 25,000 annual deaths from pancreatic cancer, saving 6750 lives in the United States each year. The pathogenetic mechanism may relate to exposure to tobacco metabolites in bile acids or blood. Although overall mortality from stomach cancer has declined, recent evidence has shown a 50% increase in mortality ratios from this disease among those who smoke compared with those who do not.¹⁴ In 1994, Yu and coworkers⁸³ reported that cigarette smoking seems to play a significant role in the latter stages of hepatocarcinogenesis. The strength and consistency of the association between smoking and colonic polyps suggest that smoking may primarily affect an early stage in the development of colon cancer.⁸⁴ If this association is causal, then tobacco use may be responsible for 16% of colon cancer deaths and 22% of rectal cancer deaths, based on a large study of US veterans.⁸⁵ A major prospective study of data from the Health Professionals Follow-up study provides strong epidemiologic evidence of a causal link between smoking and colorectal cancer; smoking in the prior 20 years was found to have a strong relationship to small colorectal adenomas, smoking at least 20 years in the past was related to large adenomas, and smoking for 35 years was related to a risk of colorectal cancers.⁸⁶ Cancer of the anus is more common in people who smoke than in those who do not.⁸⁷

The fact that cigarette smoke contains at least two known causes of leukemia (benzene and ionizing radiation polonium 210) may explain the epidemiologic association between smoking and lymphoid and myeloid leukemia.¹⁴ Attributable risk estimates of the proportion of cases of leukemia caused by smoking range from 20% to 30%;⁸⁸⁻⁹⁰ a metaanalysis of seven prospective studies and eight case-control studies suggests that approximately 14% of all US leukemia cases may be due to cigarette smoking.⁹¹ Brown and colleagues⁹² reported that

smoking in large numbers toward the end of the 19th century—in part because antisputting ordinances to curtail the spread of tuberculosis had led the tobacco companies to switch from the promotion of chewing tobacco and cigars to the inhalation of tobacco smoke by means of the cigarette. Smoking did not take hold among women until the 1920s when the American Tobacco Company began a mass media advertising campaign with the slogan, “To keep a slender figure, reach for a Lucky Strike instead of a sweet.” At that time, women did not smoke as many cigarettes or take as many puffs per cigarette as men.¹⁰⁵ The appearance of motion picture heroines, athletes, and socialites in cigarette advertisements in the 1930s led to an increase in smoking among women, so that by World War II a third of American women were smoking.

In 1968, cigarette maker Philip Morris began to associate smoking with the women’s liberation movement by launching its Virginia Slims brand on a massive scale in the broadcast and print media with the slogan, “You’ve come a long way, baby.” The name Virginia Slims (and other brands such as SilvaThins) also underscored the constant pressure on women to be slender. By analyzing data from the National Health Interview Surveys, Pierce and associates¹⁰⁶ believe that in girls younger than 18 years, smoking initiation increased abruptly in the late-1960s when such gender-directed advertising was introduced.

When overt cigarette advertising was no longer permitted on television in 1971, the company created the Virginia Slims Tennis Circuit, telecasts of which circumvented the tobacco advertising ban by featuring players as young as 14 amid dozens of courtside billboards for Virginia Slims. (When the cigarette company ended its 25-year sponsorship of the women’s tennis circuit in 1994, the players rejected as unseemly a new sponsor—a tampon manufacturer—and the tour waned. Since 1994 Philip Morris has sponsored the most famous players in Virginia Slims Legends, a national tour of exhibition matches and music concerts, with part of the proceeds benefiting the American Foundation for AIDS Research and other AIDS charities.)

In 1981, in an article in an advertising journal headlined “Women top cigarette target,” the chief executive officer of RJ Reynolds described the women’s market as “probably the largest opportunity” for the tobacco company.¹⁰⁷ Women remain a prime target for cigarette advertisers. Smoking rates among less educated young women are increasing, as is the amount they smoke.¹⁷ In 1990, the marketing plan for a new brand of RJ Reynolds cigarettes, Dakota, identified a specific target: “virile females” ages 18 to 20 who have no education beyond high school and who aspire “to have fun with [their] boyfriends and partying.”¹⁰⁸ The marketing plan clearly set out to imitate the rugged Western theme of Philip Morris’ Marlboro, the number one brand by far among both men and women. Other more overtly female brands include Eve (Liggett), Style (Loews), Capri (BAT), More (RJ Reynolds), and Misty (American Tobacco). Cigarette manufacturers sponsor a host of activities, including fashion shows, art exhibitions, and family reunions; and offer T-shirts, diaries, and fashion accessories free of charge or in exchange for proof of purchase. Virginia Slims remains the most visible women’s brand with a popular “V-Wear” fashion catalogue and a public opinion survey frequently cited in the news media.

Such promotions have overwhelmed efforts to educate young women about the adverse effects of cigarette smoking. The

emphasis of public health campaigns on the dangers of smoking has failed to address the ubiquitous, sophisticated, and carefree appeal of cigarette advertising. By 1985, lung cancer had surpassed breast cancer as the leading cause of cancer deaths among women,¹⁷ a fact that is virtually unreported in women’s magazines, of which only a handful do not accept cigarette advertising.¹⁰⁹ The subject also receives surprisingly scant coverage on television, doubtless in part due to the advertising clout of the food subsidiaries of tobacco conglomerates.

Cigarette smoking results in other problems for women, especially during pregnancy. There is a confirmed association between maternal smoking and low-birthweight infants; and there is an increased incidence of premature birth, spontaneous abortion, stillbirth, and neonatal death.¹¹⁰

Although there has been a dramatic decline in smoking among physicians, medical students, and most other health professionals during the past several decades, smoking among nurses has not declined. Jacobson attributes this to anger by nurses at their subordination within a health service dependent on women but controlled by men.¹¹¹ Indeed, for the most part nurses have been the objects of study rather than initiators of action on smoking. Two excellent recent publications could enhance participation by the nursing profession in efforts to curtail tobacco use: *Nursing Care of the Patient Who Smokes*¹¹² and *Nurses: Help Your Patients Stop Smoking*.¹¹³ Another hopeful sign is the recent establishment by the American Medical Women’s Association of a Strategic Coalition of Girls and Women United Against Tobacco,¹¹⁴ which joins a growing international movement to prevent female morbidity and mortality caused by tobacco from ever reaching the levels experienced by men.¹¹⁵

INVOLUNTARY (PASSIVE) SMOKING

Two thirds of the smoke from a burning cigarette never reach the smoker’s lungs, but instead go directly into the air.¹¹⁶ The 1986 report of the Surgeon General, dedicated to a discussion of involuntary or passive smoking, defined environmental tobacco smoke (ETS)—also called secondhand smoke—as the combination of sidestream smoke emitted into the air from a burning cigarette between puffs and the fraction of mainstream smoke exhaled by one who smokes.¹¹⁶

There is considerable evidence that many persons who do not smoke absorb and metabolize significant amounts of secondhand smoke. An increasing number of studies have explored the health risks of the nonsmoker who is exposed to ETS,^{17,116,117} and a heated scientific and political battle has ensued. Scientific opinion has run the gamut from one epidemiologic report that ETS is the major cause of avoidable mortality in nonsmokers, exceeding alcohol,¹¹⁸ to another that described the increased relative risks of lung cancer and other diseases attributed to ETS in some epidemiologic studies as marginal and likely to be statistical artifacts, derived from unaccounted confounders and unavoidable bias.¹¹⁹ In 1993, the United States Environmental Protection Agency (EPA), despite enormous political pressure by the tobacco industry, published the most thoroughly documented analysis ever undertaken of the effects of exposure to ETS. The report, “Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders,”¹²⁰ concluded that secondhand smoke can cause lung

cancer in nonsmoking adults and impair the respiratory systems of children. The EPA estimates that approximately 3000 nonsmoking Americans die annually due to lung cancer caused by secondhand smoke; of these, 2200 are believed to occur from exposure to secondhand smoke at the workplace and 800 from exposure at home. In addition, between 150,000 and 300,000 cases of pneumonia or bronchitis in children under 18 months of age are attributed to exposure to ETS.

Of 30 studies analyzed in the EPA report, 24 found an increased risk of lung cancer for nonsmoking wives of husbands who smoked; each of the 17 studies that examined lung cancer risk based on level of exposure reported an increase in lung cancer among those subjects who were most exposed. The tobacco industry was predictably unpersuaded by the EPA report, arguing that its authors had a predetermined bias.¹²¹ (In fact, several members of the report panel had received research funding by the tobacco industry.) One industry-funded author has raised an ethical question concerning what he considers to be the unwarranted elevation of heuristic hypotheses into official precepts: "Should a claim of best intentions justify representing conjecture as scientific knowledge in public policy formulation?"¹²² The tobacco industry continues to maintain that nonsmokers are exposed to insignificant amounts of secondhand smoke; indeed, the industry originated the term ETS, as if to imply that tobacco smoke is a natural constituent of the environment. Although public health organizations had hoped that publication of the EPA report would facilitate the implementation of proposed regulations by the Occupational Safety and Health Administration (OSHA) to eliminate smoking in the workplace, scientific and legal challenges by the tobacco industry are destined to delay the OSHA policy indefinitely. A more immediate impetus for workplace smoking bans by employers may come from civil litigation brought by employees claiming to have been made ill by exposure to tobacco smoke on the job. In 1995, the widower of a Veterans Affairs hospital psychiatric nurse who died of lung cancer and had never smoked was awarded a judgment from the Department of Veterans Affairs for failing to have provided a nonsmoking work environment. The tobacco industry itself is the defendant in a major class action suit in Florida brought by flight attendants who claim that their involuntary exposure to tobacco smoke in airliners over many years caused serious illnesses.

SPITTING TOBACCO

Snuff-dipping, the practice of placing a pinch or small pouch of powdered, flavored tobacco in the cavity between gum and cheek and sucking on the "quid," has increased dramatically among adolescents in the past 25 years. The consumption of chewing tobacco, the use of which involves a "chaw" that is held in the inner cheek area, has also increased.¹²³ Both forms of tobacco require continual expectoration, hence, the term, spitting tobacco. The manufacturers of these products prefer the term smokeless tobacco, implying that it is a safe alternative to smoking. After the publication in 1964 of the first Surgeon General's Report on Smoking and Health, sales of spitting tobacco began to increase.⁴ Consumption of snuff products nearly tripled between 1972 and 1991.¹²⁴ Connolly (personal communication, 1992) estimated that there are 16 million users of these products in the United States alone, of whom 3 million are younger than

the age of 16. Disturbing increases have been reported among young girls, and among American Indians.¹²⁵

Snuff can appreciably accelerate a litany of destructive changes, including gingival recession, tooth abrasion, and periodontal bone destruction. Leukoplakia (also called snuff-dipper's keratosis or smokeless tobacco keratosis), a nonspecific white patch involving the epithelium of the oral mucosa, is most often attributed to the use of tobacco and is found in 13% to 64% of users (G. Connolly, unpublished data, 1992). It is the most common of all chronic mucosal lesions, affecting 3% of adults¹²⁶; it is usually reversible if use of tobacco products is discontinued.¹²⁷ About 1 in 20 cases of leukoplakia will undergo malignant transformation into an epidermoid carcinoma. There appears to be a high incidence of recurrence at the presenting site as well as of second oral cavity tumors at a new site 2 or more years later.¹²⁸ *N*-nitrosonornicotine, one of four tobacco-specific nitroamines that have been isolated from snuff, has been shown to be tumorigenic in experimental animals.^{129,129} Snuff has been found to contain other potent carcinogens, including polycyclic aromatic hydrocarbons and radiation-emitting polonium. Smoking and drinking add to the carcinogenic risk in the oral cavity.¹³⁰

In India, where there is widespread chewing of betel nut and tobacco in combination, Jayant and colleagues¹³¹ found a six-fold higher risk for cancer of the oral cavity relative to the nonchewer, nonsmoker.

For most of the 20th century, snuff-dipping in the United States was a practice confined largely to Southern rural women, in whom the chance of contracting oral cancer has been found for long-term users to be 50 times that of nonusers of snuff.¹³² Similarly, tobacco chewing was largely a custom among rural men. In 1980, Christen and associates¹³³ called attention to widespread snuff-dipping and tobacco-chewing habits among baseball and football players in colleges, high schools, and elementary schools in Texas. This phenomenon coincided with television and print media advertising by the United States Tobacco Company (UST) for its Skoal and Copenhagen snuff products that featured testimonials of well-known professional athletes and country music entertainers. A pioneer in the practice of offering free samples of snuff by mail and at concerts and sporting events, UST boasted in a tobacco trade journal in 1984 that its advertisements in such publications as *Sports Illustrated*, *Playboy*, *The National Enquirer*, and *The New York Times Magazine* generated 400,000 written requests for samples in just 3 months.¹³⁴ Although television advertising for spitting-tobacco products was prohibited by the Comprehensive Smokeless Tobacco and Education Act of 1986, the promotion of these products on television has continued virtually unabated in the form of sponsored sporting events. In 1991, the Federal Trade Commission acted to limit violations of the law by the Pinkerton Tobacco Company, sponsors of the televised "Red Man Chew Tractor Pulling Series," but UST's Skoal and Copenhagen remain as visible as ever on televised auto races and rodeos. (In 1995, the Justice Department acted to enforce the law that since 1971 has prohibited cigarette advertising on television; regrettably, it shied away from confronting the broadcasting companies and the most frequent violators in motor sports, demanding instead that the few remaining tobacco billboards in baseball and football stadiums be moved out of range of TV cameras. Although the FDA proposed prohibiting tobacco brand-name sponsorship of sports, the Cana-

dian Supreme Court overturned a similar regulation. The advent of satellite, cable, and interactive television in an increasingly global marketplace have rendered it impossible to eliminate tobacco brand logotypes from the airwaves.)

Although collaborative education programs have been established between health agencies such as the NCI and sports organizations such as Major League Baseball, the upward trend has continued among young athletes. College athletes have been found to believe that male peers, coaches, and professional athletes are indifferent to spitting tobacco use.¹³⁵ One study examining the use of spitting tobacco across geographic locations found that among 2000 students in sixth through ninth grade, use of spitting tobacco was reported by 12%.¹³⁶ Ominously, UST and other oral tobacco manufacturers have launched a host of smokeless products in candy flavors. In addition, internal documents from UST published in the news media in 1995 revealed an apparent company strategy to "graduate" users from sweeter products with less nicotine to stronger, higher nicotine brands.

Dental and otolaryngological societies have become more vocal in warning of the dangers of spitting tobacco. Stevens and associates¹³⁷ are encouraged by their finding that given the proper educational resources dentists and dental hygienists can succeed in reducing spitting tobacco use by 50% among their patients. Efforts of Connolly and others have led to a ban on spitting tobacco in New Zealand (1987), Ireland (1988), Hong Kong (1988), and Australia (1990). In 1991, the European Bureau for Action on Smoking Prevention (BASP) successfully campaigned for a ban on these products in the European Economic Community (EEC). In 1995, the EEC rejected a ban on cigarette advertising and eliminated funding for BASP, which closed.

In a controversial proposal that has caused consternation in dental and public health organizations, the chairman of a department of oral pathology has recommended that spitting tobacco be used as a cigarette substitute by persons who cannot stop smoking.¹³⁸ Dr. Brad Rodu estimates that if the US smoking population switched to so-called smokeless tobacco, there would be at worst 6000 deaths annually from oral cancer versus the current 419,000 deaths from smoking-related cancers, heart problems, and lung disease.¹³⁹

EFFORTS TO CURTAIL TOBACCO USE

Although there is hardly a child or adult who has not heard that smoking is dangerous to health, the prevalence of smoking has declined by only 0.5% per year in the United States during the past 10 years.¹⁷ By repeatedly citing seemingly improving prevalence figures and mentioning the 40 million Americans who have stopped smoking since 1964, health agencies underemphasize the fact that the number of current smokers has remained virtually constant at more than 50 million. Women, blue-collar workers, and minority groups in general are not appreciably reducing their cigarette consumption, and smoking rates among adolescents appear to be approaching the rates found in adolescents in the mid-1970s.¹⁴⁰ Although physicians and other health professionals should be working to end the tobacco pandemic, comparatively few are taking concerted action.^{24,25,141,142} One obstacle is complacency stemming from the belief by some health professionals and some of the public that the war on smoking has been won. Physician involvement

in countering the tobacco pandemic need not be confined to the office or hospital; indeed, many local, state, and national strategies related to legislation, public health policy, and economics would benefit from the contribution of physicians.

The remaining discussion in this chapter concerns the challenge to health care professionals to reexamine their approaches, attitudes, and vocabulary; and to begin looking at the tobacco problem as much in terms of promoting a consumerist message of not buying cigarettes as of promulgating a health behavior of not smoking. Such a view may lead to a better understanding of why tobacco advertising has been more successful than health education and why the tobacco industry could be considered as a leading health educator.

INITIAL EFFORTS, PUBLIC INFORMATION, AND SMOKING CESSATION

In the late 19th century and early 20th century, the crusading campaigns of such people as Lucy Page Gaston led to the enactment of numerous laws prohibiting smoking in public places. Much of this success was undone by efforts on college campuses to portray smoking as a symbol of women's emancipation and by fund-raising programs of medical societies to send cartons of cigarettes to soldiers during World War I. Although the impact of publicity that surrounded the release of the Surgeon General's report in 1964 was demonstrated by an increased awareness of smoking-related health risks, this short-term dissemination of information did little to solve the problem.²⁴ Although programs emerged to help adults in their efforts to stop smoking, comparatively few resources have been devoted to primary prevention, specifically a reduction in demand for cigarettes. To be sure, the publication of research in 1991¹⁴³ that indicated a high level of awareness among children of the cartoon symbol for Camel cigarettes led many health organizations to pass resolutions calling for a federal prohibition of tobacco advertising, with the assumption that such a ban would result in a dramatic decline in tobacco consumption. While certain antismoking groups were seeking to inspire public outrage over the cartoon Camel (the AMA organized an anti-Camel march on a Chicago street), sales of the leading cigarette brand, Marlboro, which controls 70% of the adolescent market and overall has 10 times the market share of Camel, continued to soar.

Ultimately, the near-unanimous assumption of the vast literature of smoking cessation is that the major determinants of smoking behavior are within the individual person. Until the 1990s, the propaganda that not only promotes the initiation of tobacco use but also helps maintain it was largely ignored by researchers and health agencies.

Approximately 300 cessation methods have been reported in the literature.¹⁴⁴ Popular techniques in the 1960s and 1970s included 5-day plans, group therapy, hypnosis, conditioning-based approaches such as rapid smoking and satiation, self-help manuals, special filters, and over-the-counter pharmaceutical products containing either nicotine analogues or aversive chemicals. Approaches that were popularized in the 1980s included acupuncture, nicotine chewing gum, and physician counseling. In 1992, the introduction of transdermal nicotine patches through extensive promotional efforts aimed at pharmacists, physicians, and the lay public has created intense interest in smoking cessation. As with previous pharmacologic aids, the great expectations for the patch are unlikely to be fulfilled.

Nonetheless, most smoking cessation investigators believe that nicotine-based medications in the form of chewing gum or transdermal patch can provide effective treatment for tobacco dependence. They report rates of success two to three times greater than among those who tried to stop on their own. Such products, which are designed to facilitate abstinence from tobacco by partially replacing nicotine, appear to enhance smoking cessation in three ways: reducing nicotine withdrawal symptoms, sustaining tolerance (reducing the reinforcing effects of tobacco-delivered nicotine), and maintaining desirable mood and attentional states.¹⁴⁵ In the absence of ancillary support such as physician counseling or programs of behavior modification, the products are not usually effective in smoking cessation, but appear to be useful for short-term use in patients in hospitals, where smoking is not permitted.

"Quit clinics" have been developed in the past 10 years by the ACS (FreshStart Program) and the American Lung Association (Freedom from Smoking) designed to be implemented in small group sessions to help participants understand why people smoke, to handle withdrawal symptoms, and to manage stress. Such methods focus primarily on cognitive and behavioral approaches, and secondarily on attitudinal objectives.

In 1982, the NCI initiated its Smoking, Tobacco, and Cancer Program (STCP) as part of a restructuring of its cancer control activities. Out of the STCP, the NCI developed a 4-year, \$45 million Community Intervention Trial for Smoking Cessation (COMMIT), the largest smoking intervention trial in the world. The project, which included 11 pairs of matched communities (one community in each pair served as the intervention site and one as the control site), focused on interventions primarily among heavy smokers. In 1995, NCI researchers reported that at the end of the trial smoking prevalence rates were the same in both groups of communities and that the stepped-up pressure on people who smoked more than 25 cigarettes a day had no more effect than the routine smoking information average Americans hear every day.¹⁴⁶ The failure of the project's primary outcome measure was attributed to the powerful nature of nicotine addiction. Failures of other large smoking intervention projects were reported in 1995.

In 1991, the NCI (with logistic support from the ACS) embarked on a major tobacco control project called the American Stop Smoking Intervention Study for Cancer Prevention (ASSIST). The project, which provides funds to the health departments in 17 states, concludes in 1998. Each of the 17 funded states has assembled a coalition to disseminate materials through specific channels of intervention, including health care agencies, work sites, schools, media, and community networks. The ambitious goal of this \$120 million project was to assist the NCI in achieving its goal of reducing cancer mortality rates by 50%. Because the tobacco industry is to spend more than \$28 billion on advertising and promotion during the years of ASSIST, critics decry this goal as overly optimistic. In 1995, the NCI acknowledged the goal would not be met.

Although 1.5 million Americans stop smoking each year, a similar number of adolescents begin smoking. At the same time, tobacco companies have maintained and increased efforts to promote smoking. Their appeals to freedom, wealth, glamour, manliness, athletic prowess, and sexual attractiveness undermine public health efforts.

Smoking cessation programs for the individual person cannot truly succeed in the absence of both workplace smoking

bans and multimedia counteradvertising strategies that weaken the influence of the tobacco industry and reinforce the physician's office-based efforts.

Although cigarette smoking becomes an addiction, it is first a learned behavior. The peer pressure cited by tobacco companies as the reason for adolescent smoking is as much a manufactured product as the cigarette. The purpose of advertising is to sell cigarettes, to promote and reinforce the social acceptability of smoking, and to encourage complacency toward the enormous social and health toll taken by smoking-caused diseases. Cigarette manufacturers spend more money annually to promote smoking than is spent to advertise almost any other consumer product.

A CONSUMERIST APPROACH TO SMOKING CESSATION

Ideally, the validity of the success of a smoking cessation method should rest on the results of a controlled, double-blind study for which there is a follow-up of at least a 6-month duration of all participating subjects.^{144,147} Few published outcome evaluations meet such criteria. Despite insufficient evidence to back up advertised claims, expensive commercial aids and clinics for smoking cessation proliferate. Many methods are costly, but having to pay a high fee for alleged smoking cure may be the most motivating aspect of the method's success.

Physicians' active involvement in smoking cessation, akin to their role in the prevention of smoking among adolescents and children, can be crucial.¹⁴⁸ In the late 1970s, at a time when efforts to discourage smoking were much less widespread and accepted, Russell and colleagues¹⁴⁹ found that 1 or 2 minutes of simple but unequivocal advice to stop smoking on the part of the physician resulted in a cessation rate of more than 5% measured at 1 year compared with 0.3% in the control group.

Although many people say they have stopped on their own, such persons may not consciously attribute their success to the increasing social pressures that reinforced their decision. Not only has organized medicine become united on the need for more assertive office-based and community-wide strategies to end smoking, but also other forces in society, including large corporations and governmental agencies, have implemented smoke-free policies.

OFFICE-BASED STRATEGIES

Many factors may inhibit physician involvement in smoking cessation, such as time constraints; the lack of reimbursement by third-party payers for such counseling; and the absence of peer group reinforcement in a technologically oriented, tertiary care-centered health care system.

There is much the physician can do to become a better teacher about smoking in lieu of relegating this role to ancillary personnel, a smoking cessation clinic, or a pamphlet. The physician can develop an innovative strategy beginning outside the office or building. A bus bench, billboard, or sign in the parking lot with a straightforward or humorous health promotion message helps establish a thought-provoking and favorable image.

Magazines with cigarette advertisements should not appear in the physician's office in the absence of prominent stickers

or rubber-stamped messages calling patients' attention to the deceptive, often absurd nature of such ads. Although responsibility for the office-based smoking cessation strategy should rest with the physician, it is invaluable to include all office staff as positive reinforcers for patients. Labeling each chart with a small no-smoking sticker to indicate the need for such reinforcement may be helpful, although care must be taken to avoid stigmatizing the patient as a smoker.

The key to successful smoking cessation efforts is a positive approach. A discussion about the diseases caused by smoking and the harmful constituents of tobacco smoke is essential—the physician would do well to impart, through graphic posters, pamphlets, slides, and other audiovisual aids, the gruesome consequences of smoking—but the benefits of not smoking must be emphasized as strongly. Educating patients about the facts of smoking in a single office visit is unlikely to result in behavioral change.

Through the use of creative analogies related to the patient's occupation, hobbies, or romantic interest, the physician can succeed in changing the patient's attitude toward smoking. For example, naming a partial list of the poisons and irritants in tobacco smoke, such as hydrocyanide acid (cyanide), ammonia, formaldehyde, and carbon monoxide, may mean little at first. By noting that cyanide is the substance used in the gas chamber in executions, that formaldehyde is used to preserve cadavers, and that ammonia is the predominant smell in urine, the physician is likely to lead the patient to think differently about cigarettes.

METAPHORS THAT MOTIVATE

A change in vocabulary on the part of the physician is essential for making progress in office-based smoking cessation. Instead of pack-year history, a more relevant term is the inhalation count. A pack-a-day smoking patient will breathe as many as 1 million doses of cyanide, ammonia, carcinogens, and carbon monoxide in less than 15 years, not including the inhalation of other peoples' smoke. Another way to emphasize the enormous amount smoked is to state the amount smoked in financial terms: a pack-a-day cigarette buyer will spend in excess of \$800 a year (calculated at \$2.25 a pack), or in excess of \$10,000 in 10 years if that money were put into a savings account or bond.

Although patient education and smoking cessation rest on the knowledge of the deleterious aspects of adverse health behavior, the cognitive component alone is insufficient. Both the physician and the patient must be motivated to succeed. Three keys to office-based smoking cessation are to personalize, individualize, and demythologize.

The physician can learn to personalize approaches to smoking cessation by carefully screening existing pamphlets and other audiovisual aids or by producing one's own handout. It is essential to scrutinize all such material, as one would with a new drug or medical device. Personally handing a brochure to the patient while pointing out and underlining certain passages or illustrations provides an important reinforcing message. The pamphlets, posters, and signs should be changed or otherwise updated every few weeks or months.

Individualizing the message to the patient is the cornerstone of success in patient education. The same cigarette counseling

method cannot be used for a high school student, a construction worker, and an executive already showing signs or symptoms of heart disease. In the case of a high school student, the physician not only should focus on such topics as emphysema and lung cancer but also should emphasize the cosmetic unattractiveness of yellow teeth, bad breath, loss of athletic ability, and financial drain that results from buying cigarettes. To the construction worker, the physician might suggest the likelihood of fewer lost paydays, greater physical strength, and greater ability to work if smoking is stopped.

In talking with the concerned executive, one should demythologize certain beliefs about smoking, such as that ultralow-tar cigarettes are safer. To the contrary, use of so-called low-tar brands may result in compensatory deeper inhalation of greater concentrations of chemical additives and noxious gases that increase the risk for heart attack.

DEBUNKING COMMON MYTHS

An important myth surrounding smoking is that it relieves stress. This idea can be debunked by pointing out that the stress that is relieved is that which resulted from being dependent on nicotine—this is the essence of addiction. At the same time, slow, deep breathing has a relaxing effect. The physician can suggest that patients try to postpone for 5 minutes every time they intend to light up, next inhale deeply for 5 minutes, and then reconsider if the cigarette is important.

Another myth reinforced in advertisements for Virginia Slims and other cigarettes aimed at women and girls is that smoking keeps weight off. One need not gain weight when stopping smoking if one relearns to enjoy walking and running as much as one relearns the taste of food. By no means do all persons who stop smoking gain weight. Even among those who do, the average weight gain is less than 5 lb.¹⁵⁰

Perhaps the biggest myth that has been encouraged in the medical literature is that the patient must be "ready to quit." Although common sense dictates that those who express a greater interest in smoking cessation will have a greater success rate, those patients who do not express an interest in smoking cessation symbolize the overall challenge to be faced in curing the pandemic. One of the reasons for the lack of motivation of patients may be their sense of inevitability of failure. It is conceivable that by not educating the nonmotivated smoking patient, the physician is reinforcing the notion that it may be too difficult to stop smoking.

Setting a quit date, the essential element of the smoking cessation literature, may rationalize the continuation of an adverse health practice and may strengthen denial. It is helpful to remind patients that they can stop now. If they do not stop, this does not mean the physician will not treat them the next time, but it is important to give encouragement and not reinforce excuses. It is helpful to give patients a few written reminders such as lists of the advantages and disadvantages of smoking, a set of rewards for not smoking and penalties for lighting up, the situations and environmental influences that encourage one to smoke, and the myths of smoking and smoking cessation. A prescription with a no-smoking symbol signed by the physician and included with the other prescriptions is a thoughtful gesture. The physician should not advise "cutting down," switching to a low-tar cigarette, or changing to a pipe or cigar.

CONSUMER ADVOCACY ROLE

Traditional office-based approaches begin by asking, "Do you smoke?" and "When did you start smoking?" Although this may provide the physician with relevant data for charting purposes, this approach is too often a signal for the patient to become defensive and resistant to further discussion, especially if the patient had no intention to stop smoking. There are alternative ways of obtaining information and at the same time piquing the patient's interest in the subject. By using and identifying with the vocabulary used by the consumer of cigarettes, the physician can adopt (and be perceived in) the role of consumer advocate as opposed to medical "finger-wagger." The most important and nonthreatening questions to ask are, "What brand do you buy?" and "How much do you spend on cigarettes?" The patient is likely to be surprised and intrigued by these questions, which can be asked at any time in the course of the interview, because they appear to be nonjudgmental. They serve to suggest that the physician is not a know-it-all and a polemicist. A question about the cost of cigarettes shows concern for the patient's financial well-being.

Promotions for various pharmacologic agents, mail order gadgets, and clinics in smoking cessation reinforce the notion that cigarette smoking is primarily a medical problem with a simple, easy to prescribe for, nonindividualized solution. When a patient requests a "drug that will help me stop smoking," the physician must confront the dilemma of not wanting to dash the patient's expectation while emphasizing that a drug or device is, at best, an adjunct and not a means of smoking cessation.

APPROACH TO ADOLESCENTS

Children and adolescents who smoke cigarettes pose a special challenge, because they represent the market most carefully nurtured by tobacco advertisers. It is essential to avoid emphasizing the adult and dangerous nature of smoking. Smoking should be referred to as the self-deceptive and short-sighted practice that it is. The single most important statement the physician can make to an adolescent is, "Come on, you're too old to smoke. That's for 11- and 12-year-old children who are trying to look grown up." Another strategy is for the physician to ask the adolescent who smokes to help think of ideas for talking to junior high school and primary school students who are just taking up smoking.

As a general rule, in approaching the subject of smoking cessation with a patient, time and commitment on the part of the physician results in greater success. The biggest obstacle to smoking cessation is complacency on the part of the physician.

ENDING THE TOBACCO PANDEMIC

In 1977, a physician-based organization, DOC,* was founded to educate the public, especially young people, about the major preventable causes of poor health and high medical costs. Its

primary goal is to tap the highest possible level of commitment from every physician, resident, and medical student in ending the tobacco pandemic.

DOC's unique, multilayered approach involves the creation of strategies for the clinic, the classroom, and the community. Although there have been significant strides made by the NCI and the AMA during the 1980s to encourage greater involvement of physicians with tobacco control, most programs have underused physicians, physicians in training, and other health care professionals.

To begin to realize a smoke-free society, physicians and other health care professionals must expand their vision beyond the stream of individual patients passing through their examining rooms to a concern for proactively and systematically dealing with the health needs of the larger community.

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* For more information about DOC and its programs, write to DOC, c/o Department of Family Medicine, Baylor College of Medicine, 5510 Greenbriar, Houston, TX 77005.

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