The Health Consequences Of Smoking

CHRONIC OBSTRUCTIVE LUNG DISEASE

a report of the Surgeon General

1984

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THE SECRETARY OF HEALTH AND HUMAN SERVICES
WASHINGTON, D.C. 20201

The Honorable Thomas P. O'Neill, Jr.
Speaker of the House of Representatives
Washington, D.C. 20515

Dear Mr. Speaker:

It is a pleasure to transmit to the Congress the Surgeon General's Report on the Health Consequences of Smoking, as mandated by Section 8(a) of the Public Health Cigarette Smoking Act of 1969. This is the Public Health Services' 16th report on this topic and, like all of the earlier Reports, it identifies cigarette smoking as the chief preventable cause of death and disability in our society.

The enclosed report deals with the relationship between smoking and those disease conditions described as chronic obstructive lung disease, particularly chronic bronchitis and emphysema. These diseases significantly increase patient loads in hospitals and other health care facilities and escalate this Nation's health care costs, including expenditures under the Medicaid and Medicare programs.

This report indicates that chronic obstructive lung diseases can be reduced and, in the case of emphysema, almost eradicated, if individuals stop cigarette smoking. Moreover, stopping smoking also would prevent the enormous suffering and human loss now well-known to be associated with smoking.

This Department has a strong and ongoing commitment to its programmatic and research efforts in the field of disease prevention. In our view, it is essential to apprise individuals of the consequences of smoking. A central part of our efforts is to identify ways to help smokers quit smoking, and to encourage individuals, particularly the youth of this country, not to begin smoking.

Sincerely,

Margaret M. Heckler

Margaret M. Heckler
Secretary

Enclosure

THE SECRETARY OF HEALTH AND HUMAN SERVICES
WASHINGTON, D.C. 20201

The Honorable George Bush
President of the Senate
Washington, D.C. 20510

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FOREWORD

The 1984 Report on the Health Consequences of Smoking constitutes a state-of-the-art review of the information currently available regarding the occurrence and etiology of chronic obstructive lung diseases.

Traditionally, chronic bronchitis and emphysema have been subsumed under the term chronic obstructive lung diseases (COLD). It is now recognized that COLD comprises three separate, but often interconnected, disease processes: (1) chronic mucus hypersecretion, resulting in chronic cough and phlegm production; (2) airway thickening and narrowing with expiratory airflow obstruction; and (3) emphysema, which is an abnormal dilation of the distal airspaces along with destruction of alveolar walls. The last two conditions can develop into symptomatic ventilatory limitation.

Although there were scientific reports of a link between cigarette smoking and respiratory symptoms as early as 1870, it was not until the comprehensive review in the first Report of the Advisory Committee to the Surgeon General in 1964 that the nature of the observed association was officially recognized by the Public Health Service.

At that time the committee concluded that

> Cigarette smoking is the most important of the causes of chronic bronchitis in the United States and increases the risk of dying from chronic bronchitis and emphysema. A relationship exists between cigarette smoking and emphysema, but it has not been established that the relationship is causal.

On the basis of the evidence reviewed in this volume, we are now able to reach a much stronger conclusion:

> **Cigarette smoking is the major cause of chronic obstructive lung disease in the United States for both men and women. The contribution of cigarette smoking to chronic obstructive lung disease morbidity and mortality far outweighs all other factors.**

The Importance of Chronic Obstructive Lung Disease

Previous Reports on the health consequences of smoking emphasized the impact of cigarette smoking on mortality from smoking-related disease. It is estimated that more than 60,000 Americans died last year owing to chronic obstructive respiratory conditions

(chronic bronchitis, emphysema, and COLD and allied conditions). From available epidemiologic and clinical evidence, it may be reasonably estimated that approximately 80 to 90 percent of these are attributable to smoking. Over 50,000 of the COLD deaths can therefore be considered preventable and premature because these individuals would not have died of COLD if they had not smoked. While smoking-related COLD mortality is less than estimates for smoking-related deaths due to coronary heart disease (170,000) and those due to cancer (130,000), it nonetheless represents a significant number of excess deaths.

COLD morbidity has a greater impact upon society than COLD mortality. Death from COLD usually occurs only after an extended period of disability, and many individuals with disability from COLD will die from other causes before the disease progresses to a degree of severity likely to cause death. The progressive loss of lung function that characterizes COLD can lead to severe shortness of breath, limiting the activity level. In recognizing the morbidity associated with these diseases, it is important to realize that the frequency of activity limitation with COLD exceeds that reported for any other major disease category. In 1979, 52 percent of individuals with emphysema reported that it limited their activity; 27 percent said it resulted in one or more bed days that year; and 73 percent reported at least one visit to a doctor during the preceding year due to emphysema. Forty percent more people with emphysema than with heart conditions reported limitation of activity. More recently, the National Center for Health Statistics has estimated that over 10 million Americans suffer from either chronic bronchitis or emphysema.

The Changing Pattern of Mortality

The 1980 and 1982 Surgeon General's Reports (*The Health Consequences of Smoking for Women* and *The Health Consequences of Smoking: Cancer*) reported a rapidly increasing rate of lung cancer among women compared with the rate for men. As this Report documents, the mortality ratio between men and women for COLD is also narrowing. In just 10 years, while total deaths from COLD increased from 33,000 in 1970 to 53,000 in 1980, the male-to-female ratio narrowed from 4.3:1 in 1970 to 2.3:1 in 1980. This epidemic increase in COLD among women reflects their later uptake of smoking when compared with men.

Findings of the 1984 Report

The mortality ratios for COLD in cigarette smokers compared with nonsmokers are as large as or larger than for lung cancer, the

disease most people usually associate with smoking. In heavy smokers, this risk can be as much as 30 times the risk in nonsmokers. Perhaps even more important, in studies of cross-sections of U.S. populations, cigarette smoking behavior is often the only significant predictor for COLD. Even after 30 years of intensive investigation, only cigarette smoking and α_1-antiprotease deficiency have been established as being able to cause COLD in the absence of other agents.

The decline in lung function with age is steeper in smokers than in nonsmokers, and the rate of decline increases with an increasing number of cigarettes smoked per day. This excess decline in lung function in smokers reflects the progressive lung damage that can eventually lead to symptoms of COLD and ultimately death. Therefore, it is not surprising that the risk of death from COLD increases with an earlier age of smoking initiation, number of cigarettes smoked per day, and deep inhalation of the smoke.

Abnormal lung function can be demonstrated in some cigarette smokers within a few years of smoking initiation. These changes initially reflect inflammation in the small airways of the lung and may reverse with cessation. Beginning in their late twenties, some smokers start to develop abnormal measures of expiratory airflow, an excess decline in lung function that continues as long as they continue to smoke. Some of these smokers will develop enough functional loss to become symptomatic, and some of those who become symptomatic will develop enough functional loss to die of COLD. When the smoker quits, the rate of functional decline slows, but there is little evidence to suggest that the smoker can regain the function that has been lost.

We are also beginning to understand that the impact of cigarette smoke on the lung is not limited to the active smoker. Children of smoking parents have an increased risk of bronchitis and pneumonia early in life, and seem to have a small, but measurable, difference in the growth of lung function.

One of the major advances described in this volume is in the understanding of the mechanisms by which cigarette smoking causes COLD, particularly emphysema. There is now a clear, plausible explanation of how emphysema might result from cigarette smoking. The inflammatory response to cigarette smoke results in an increased number of inflammatory cells being present in the lungs of cigarette smokers. These cells can increase the amount of elastase in the lung, and elastase is capable of degrading elastin, one of the structural elements of the lung. In addition, cigarette smoke is capable of oxidative inactivation of α_1-antiprotease, a protein capable of blocking the action of elastase. The net result is an excess of elastase activity, degradation of elastin in the lung, destruction of alveolar walls, and the development of emphysema.

Research scientists continue to expand our understanding of the process by which cigarettes damage the lung, but the important public health focus must shift to how to prevent children from becoming cigarette smokers and how to help those who now smoke to quit.

Helping Smokers Quit

Smokers can realize a substantial health benefit from quitting smoking, no matter how long they have smoked. As this Report states, sufficient evidence now exists to document lung function improvement in smokers who have quit. Ex-smokers can look forward to improved future health, avoiding long-term and possibly severe disability, or even death, from COLD.

Two chapters in this Report summarize research studies using two vastly different cessation approaches. One focuses on the role of physicians in assisting patient populations to quit smoking; the other looks at communitywide intervention programs. Both can have a significant impact on reducing the number of smokers in our population.

In January of this year, the Food and Drug Administration approved a nicotine chewing gum that physicians can prescribe for their patients as an aid to cessation. Studies have shown encouraging results when the gum is used as part of a complete behavior modification program. It must be cautioned, however, that nicotine chewing gum is not a magic cure. Smokers must be strongly motivated to quit or they are unlikely to meet with long-term success.

Public Attitudes and Knowledge

In 1981, a Federal Trade Commission staff report on cigarette advertising revealed that a sizable portion of the population is not aware of the link between cigarette smoking and chronic bronchitis and emphysema. The report cited a 1980 Roper survey finding that 59 percent of the population, including 63 percent of smokers, did not know that smoking causes *most* cases of emphysema. Over a third of the general population and almost 40 percent of smokers do not know that smoking causes *many* cases.

It is quite clear that physicians and other health professionals must redouble their efforts to persuade more smokers to quit. As in previous years, I call upon all segments of the health care community to provide assistance and encouragement in whatever way possible to reduce the health impact of cigarette smoking on our society, by helping their patients to quit smoking and by encouraging our young people not to take up the habit. It is only through efforts

such as these that we can reduce our country's terrible burden of disability and death due to cigarette smoking.

Edward N. Brandt, Jr., M.D.
Assistant Secretary for Health

PREFACE

This Report *The Health Consequences of Smoking: Chronic Obstructive Lung Disease* completes an examination by the Public Health Service of the three principal disease entities associated with cigarette smoking. In 1982, the Service presented an in-depth review of tobacco's relationship to cancer, and in 1983, a review of its relationship to cardiovascular disease. This 1984 Report evaluates the contribution that tobacco makes to the suffering and premature deaths due to the chronic obstructive lung diseases, including emphysema and chronic bronchitis.

Cigarette smoking is causally related to chronic obstructive lung disease, just as it is to cancer and coronary heart disease; severe emphysema would be rare were it not for cigarette smoking. The evidence presented in this Report supports my judgment and the judgment of five preceding Surgeons General that cigarette smoking is the chief, single, avoidable cause of death in our society and the most important public health issue of our time.

This Report, as were all previous Surgeon General's Reports dealing with cigarette smoking, is the work of many experts both within and outside the Federal establishment. To these authors, editors, and reviewers I again express my great respect and sincere thanks.

C. Everett Koop, M.D.
Surgeon General

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