

**HEALTH PROMOTION AND AGING
SMOKING AMONG OLDER ADULTS:
THE PROBLEMS, CONSEQUENCES AND POSSIBLE SOLUTIONS**

Author: Barbara Rimer, M.P.H., Dr.P.H.
Fox Chase Cancer Center
Philadelphia, PA 19111

I. INTRODUCTION

In smokers at any age, smoking is a modifiable behavior with serious health consequences. Unfortunately, the body of knowledge directly applicable to helping older smokers quit is limited because older smokers, as an identified group, have been a lower priority for research than younger populations. This state of affairs must change. Although the prevalence of smoking is somewhat lower in the older population than in younger groups, older adults are at least equally interested in personal health promotion; the consequences of continued smoking are especially serious for them; and the benefits of their quitting are substantial. For example, as this paper will show, smoking cessation can improve vital capacity and reduce disability and can reduce costs incurred by all third party reimbursers of health care costs, including the federal government. Clearly, older Americans who smoke should be encouraged to quit smoking. The sections that follow address the health consequences of smoking and benefits of cessation, the economic impact of smoking, potential smoking cessation strategies and recommended directions for research policy and practice.

This paper is based upon a review of the literature conducted using MEDLINE searches, current government reports and focus groups of older adults conducted during the summer of 1987 for the Office of Disease Prevention and Health Promotion (ODPHP) (Doremus Porter Novelli, 1987) and for Fox Chase Cancer Center (FCCC), Philadelphia, PA, (Rimer, research in progress).

Older Adults as a Target Group for Health Promotion

The demographic profile of American society is undergoing a dramatic shift, marked by aging of the population. Currently, 12% of the population is over 65 years; by 2010, about 14% of the population will be 65 years of age and older. Adults now aged 50-74 constitute 20% of the population and over 22% of United States smokers.

The increase in the older population is expected to occur in two stages. Through the year 2000, the proportion of the population aged 55 and over should remain relatively stable, at about 22%. By 2010, the proportion of older Americans is projected to rise sharply; more than a quarter of the total United States population is expected to be at least 55 years old, and one in seven Americans will be at least 65 years old. By 2050, one in three persons is expected to be 55 years or older, and one in five will be 65-plus (Special Committee on Aging, 1987b).

The focus of this paper will be on adults 55 years of age and older, in order to include the pre-retirement population which can be reached with the smoking cessation message at an important transition point in their lives. Moreover, the data suggest that stopping smoking in the younger-old group will have the most dramatic impact on morbidity and mortality. Some of the data are

summarized for the 65 years and older group only because of limitations in the way data are reported.

The word "older" is preferred to "old" or "elderly," since chronological age is a poor predictor of health status or lifestyle, and older people are no more homogeneous than are children or the middle-aged (Rowe and Bradley, 1983). "Old" people are seen as infirm and dependent. But the reality is that the majority of older Americans continue to lead relatively healthy, active lives well into their 80's, and Americans of all ages are healthier than they were 10 to 20 years ago (Special Committee on Aging, 1987a). Indeed, smoking may spell the difference between being "old" and simply being "older" at a later age. Consequently, it is appropriate to recognize older people as a target for health promotion and disease prevention activities (Mallamad et al., 1984; Rowe, 1985). Increasingly, it is being recommended that older people adopt healthier diets, start or continue a program of regular aerobic exercise and stop smoking (e.g., Sorenson et al., 1983; Heckler, 1985; Kane et al., 1985).

Health promotion activities can educate older people about the association between lifestyle health habits and the leading causes of death and disability and can assist people in changing behaviors that may lead to illness (Heckler, 1985).

Older adults are very much concerned with their health and health promotion (Hershey et al., 1982; Mallamad et al., 1984; ODPHP, 1984; Prohaska et al., 1985). The evidence shows that older people can benefit from a variety of health promotion programs (Leviton and Santa Maria, 1979; USDHHS, 1980; Lorig et al., 1981; Anderson, 1982; FallCreek and Stam, 1982; Kirchman et al., 1982; Lidoff and Beaver, 1982; Bolten and Ball, 1983; Moore et al., 1983; Sorenson et al., 1983; USDHHS, 1983; Barbaro and Noyes, 1984; Nelson et al., 1984; Heckler, 1985; Rimer et al., 1986a, 1986b; ODPHP, 1987). Studies indicate that when educated about health habits, older people have higher levels of compliance and behavior change than those in other age groups (Morisky et al., 1982; Green, 1985).

II. HEALTH EFFECTS OF SMOKING AND BENEFITS OF CESSATION

A. Health Consequences of Smoking

As people live longer and are less likely to die from infectious or acute illnesses, chronic health conditions such as heart disease, cancer or lung disease are accounting for both more morbidity and more mortality among older people. Smoking is considered a major risk factor in eight of the top 16 causes of death for people aged 65 and over (Special Committee on Aging, 1987b). Smoking is the single greatest cause of premature death and preventable disease and disability in the United States (USDHHS, 1986b). Smoking-related cancer deaths account for 41% of cancer deaths in males 65 years and older and 15% of cancer deaths in women 65 years and older (OTA, US Congress, 1985). The latter are expected to rise with increases in women's smoking.

Smoking exerts a significant impact on morbidity and mortality from cardiovascular, cerebrovascular and respiratory diseases. Although the risk ratio for overall mortality and morbidity from cardiovascular disease decreases with advancing age, the absolute number of deaths directly caused by cigarettes increases (Kane et al., 1985). Among adults aged 55 to 64 years, there are 996 deaths from coronary heart disease (CHD) per 100,000 men for smokers compared to

542 for nonsmokers; for adults 65 to 74 years, the rates are 1400 for nonsmokers compared to 2025 for smokers (USDHHS, 1984a).

Howard et al. (1987) found that the impact of cigarette smoking on survival after a transient ischemic attack in a cohort approximately 64 years of age was of a magnitude equal to that of a previous stroke or ischemic heart disease.

Smoking continues to affect lung function into old age (Sparrow, 1984); 55% of the respiratory-system disease deaths among men 65 years and older are attributable to smoking and 38% of women's deaths are due to smoking. Deaths from chronic obstructive lung disease (COLD) rise linearly to about 425 per 100,000 adults among smokers 75 to 84 years compared to about 50 per 100,000 for nonsmokers (USDHHS, 1984b).

Prevalence rates of cough, phlegm and chronic bronchitis among smokers are reported to have increased with advancing age in the United States population samples studied by the National Center for Health Statistics and in several cross-sectional studies (USDHHS, 1984b). Smoking appears to be a significant predisposing factor in the development of pneumococcal infections (Burman et al., 1985). Burr et al. (1985) found that the symptoms of cough and phlegm and a substantial reduction in lung function were associated with smoking. Sparrow et al. (1987), using longitudinal data from the Normative Aging Study, found evidence of an association between smoking and nonspecific airway responsiveness.

Exposure to passive smoking also is a problem for older adults, especially those with compromised health status. In urban areas, air pollutants may combine synergistically with tobacco smoke to aggravate pre-existing chronic heart and lung diseases (Mitchell et al., 1979). Passive smoking exacerbates both the onset of angina and the symptoms of bronchial asthma (Fielding, 1985a).

Smoking also complicates existing illnesses, which are likely to be more prominent in older people than in younger ones. Smoking may decrease the ability of gastric ulcers to heal, and the rate of recurrence of duodenal ulcers is higher in smokers (Achkar, 1985). Smoking also reduces smell and taste ability in older adults (Moore, 1986; Somerville et al., 1986). Smoking appears to have a negative effect on bone mineralization and density, a particular concern for older women who may be susceptible to osteoporosis (Mellstrom et al., 1982). Smoking exerts a separate and distinct effect on osteoporosis and the subsequent risk of fracture (Melton and Riggs, 1986).

Smoking can affect mean levels for drugs, such as Propanolol (Vestal et al., 1979) and interferes with a range of other drug therapies, including antidepressants, Lidocaine, Pentazocine HCl, Phenothiazines, Phenylbutazone and Inderal. Cigarette smoking dramatically decreases serum levels of Theophylline, Aminophylline and Oxtriphylline. Heavy smokers may need doses that are 50% to 100% greater than those of nonsmokers. Cigarette smoking also shortens the half life of Heparin and decreases the effectiveness of Propoxyphene (Darvon). Heavy smokers may need about one-half more Insulin than nonsmokers (Todd, 1987). The smoker who is on estrogen therapy runs an increased risk of cardiovascular complications (Todd, 1987). The result of these effects is that drug dosages for the average older person may be subtherapeutic or ineffective (Greenblatt et al., 1982). Smoking also may affect clinical test results, causing increases in values such as red cell mass, LDL cholesterol, hemoglobin and hematocrit (Mellstrom et al., 1982; USDHHS, 1986a). Mellstrom et al. (1982) also found an

elevated level of potassium in serum and plasma among smokers independently of medication.

Thus, continued smoking represents a significant health threat to older Americans. It affects every aspect of health, from increased risk of morbidity and mortality, to effects on the way life-saving drugs are metabolized.

B. Health Benefits of Cessation

There is now substantial evidence that older adults who have never smoked or are ex-smokers are healthier than those who continue to smoke. Abramson (1985) concluded, on the basis of a review of large prospective trials, that longevity can probably be increased by giving up smoking in the 60's and, especially for heavy smokers, in the early 70's. The United States Department of Health and Human Services (ODPHP, 1986) wrote that "until recently, the danger of long-term smoking was generally thought to be irreversible and permanent. We now have documented evidence that smoking cessation in older persons can produce positive health effects."

When the Honolulu Heart Program examined the biological, social and lifestyle characteristics among middle-aged men of Japanese ancestry that are associated with the maintenance of health during late adult years, researchers found that individuals who stayed healthy, smoked fewer cigarettes and consumed less alcohol. Following systolic blood pressure, smoking was the most consistent discriminator between remaining healthy and all separate categories of disease (Benfante et al., 1985).

Cessation of smoking exerts a protective action which increases with the number of years since stopping (Graham and Levin, 1971; Hazzard, 1983; Lubin et al., 1984; Vineis et al., 1984; Pathak et al., 1986). When a person of any age stops smoking, the benefits to the heart and circulatory system begin right away. The risk of heart attack and stroke drops and circulation to the hands and feet improves. The Framingham data suggest that the benefits of cessation on coronary heart disease are almost immediate while the benefits on respiratory function occur over a longer period of time (Gordon et al., 1974). Schuman (1981) found some decrease in mortality after quitting for one to four years in a study of men 50 to 69 years. In a very significant study, Jajich et al. (1984) showed that while elderly smokers had a 52% higher risk for coronary heart disease than nonsmokers, quitting smoking in later life was associated with a rapid and sustained reduction in mortality from coronary heart disease.

Significant improvements in circulation and pulmonary perfusion (Mason et al., 1983; Rogers et al., 1985) occur rapidly when older people stop smoking. The majority of improvement occurs in the first year following cessation. Cessation from smoking should produce gains in cerebral circulation and prevent further progression of cerebrovascular diseases (Rogers et al., 1985). Mason et al. (1983) concluded that much of the abnormality in pulmonary epithelial permeability induced by smoking is rapidly reversible. The cessation of cigarette smoking also has a substantial salutary impact on the incidence and progression of chronic obstructive lung disease (COLD). Cigarette smokers who quit prior to developing abnormal lung function are unlikely to go on to develop ventilatory limitations (USDHHS, 1984b). Of course, the benefits will accrue sooner for lighter and moderate smokers compared to heavier smokers (Oster et al., 1984) and will be most significant for the younger-old.

III. ECONOMIC IMPACT OF SMOKING ON OLDER ADULTS

Older adults represented only 11% of the population in 1980, but they accounted for 31% of personal health care expenditures (Rice and Estes, 1984). In 1984, per capita health care expenditures for persons 65 years and older were \$880 per person (Parsons, 1987). The costs associated with smoking exacerbate the rising health care costs experienced by older adults. Health economists have examined the costs of smoking from several vantage points: prevalence-based calculations of the national economic costs of smoking; adaptation of national estimates to calculate statewide costs; estimates of the costs to business and prospective, incidence-based estimates of the expected costs to individuals who smoke (Shultz, 1985; Schelling, 1986). The prevalence approach examines the current costs to society while the incidence approach examines primarily the future costs of smoking.

There are three kinds of costs with which we should be concerned: (1) direct costs of medical care and additional costs of disease; (2) indirect costs, including the value of lost productivity, output or foregone manpower resources and (3) intangible costs (such as the costs inflicted on others) (Rice et al., 1986). These intangible costs do not include the pain and suffering on patients and their families (Loeb et al., 1984) which are much more difficult to estimate. Direct costs rise relative to indirect costs at older ages as older people begin to retire and have fewer significant productive years ahead of them.

Current and former smokers use more medical care, experience more work-loss days and have higher mortality rates than persons who have never smoked (Rice et al., 1986). For older adults, many of these costs are borne by Medicare; some of the costs also are transferred to Social Security. Rice et al. (1986) argued that the most important costs of smoking are smoking-related diseases and the attendant morbidity, mortality, medical care costs, indirect losses and intangible losses from pain, suffering and other quality-of-life changes.

Using 1985 data, the Office of Technology Assessment (OTA, US Congress, 1985) estimated that the total health care costs of smoking-related disease amount to between \$11 billion and \$35 billion or from three percent to nine percent of total United States health care spending. Future costs for smoking-related diseases in women will be higher because of the fact that the rate of lung cancer in women has been rising exceptionally rapidly (Loeb et al., 1984). Naturally, the costs are not incurred evenly among smokers but are affected by such factors as the intensity of one's smoking and the number of years one has smoked (Oster, et al., 1984).

Even for older adults, the costs associated with smoking are profound. Smokers aged 65 and older experience more restricted activity days, hospital days and physician visits than those who have never smoked (Rice et al., 1986). Rice et al. (1986) estimated that almost \$5.67 billion in direct costs were attributable to smoking for adults 65 years of age and older. Medicare costs alone have been estimated to be \$3.4 billion annually (OTA, US Congress, 1985). These costs indeed may only represent part of the problem. For example, Melton and Riggs (1986) noted that smoking has an independent effect on osteoporosis. Osteoporosis costs the United States more than \$6 billion annually. Osteoporosis has been estimated to be a factor in 70% of fractures among white women over 40 years of age and in 15% of white men of similar age. Hip fracture incidence is about one percent per year in women enrolled in Medicare, with a cumulative incidence by 40 years of 32% for women and 17% for men (Heidrich and

Thompson, 1987). Also, cost estimates rarely reflect losses due to fire, which may be higher for older adults. In one study, 14% of fires were ascribed to cigarette smoking (Brodzka *et al.*, 1985). As already noted, the cost estimates also do not reflect intangible costs, which are undoubtedly substantial.

Oster *et al.*'s (1984) analysis showed that even for the oldest age groups (70 years and older), the cumulative economic benefits of quitting are noteworthy; from \$600 to approximately \$2500 for men and from \$400 to approximately \$3000 for women. Quitters in this age can avoid between 32% and 52% of the expected losses; younger quitters will avoid a higher proportion of losses. For adults aged 55-59 years, as much as \$9093 is saved each time one heavy smoker quits (USDHHS, 1986c).

Of course, it is possible that reductions in smoking will produce lowered costs for treating smoking-related diseases but higher costs in future years for treating the additional people who survive (OTA, US Congress, 1985). Older adults whose deaths are averted by virtue of smoking cessation may then survive to collect Social Security. They also may make additional claims to Medicare and other health insurance systems. As individuals age, their health care costs are borne not only by themselves but also by the government and by employers. However, even in the unlikely case that dollars ultimately were not saved from reductions in smoking, this still may be a cost-effective if not necessarily a cost-saving activity (Warner, 1984; OTA, US Congress, 1985). The conclusions of Oster *et al.* (1984) cannot be ignored: at any age, it literally pays to stop smoking, since the benefits of quitting are sizable.

IV. OLDER ADULTS AS A TARGET FOR HEALTH PROMOTION AND SMOKING CESSATION

A. Some Preliminary Considerations: Smoking Rates of Older Adults

Although a significant proportion of older Americans already have quit smoking, current smoking rates for adults 50-74 years old are still relatively high, particularly for those 50-65 years (32% for males 50-64 years and 27% for women of the same age) (Remington *et al.*, 1985). Rates in 1985 were 22% for men 65-74 and 16% for those 75-84. The corresponding rates for women were 18% for women 65-74 years and 8% for women 75-84 years (Havlik, 1987). There are important differences in cessation rates for population subgroups. For example, a population survey in Florida found that 33% of white men 65 years and older were ex-smokers compared to 26% of nonwhite men (Dzegede *et al.*, 1981). Smoking rates are higher for Hispanics--40% of male Mexican-Americans aged 55-74 smoke; 20% of female Mexican-Americans smoke (Havlik, 1987). Smokers 45-64 years of age are least likely to try to quit smoking and least likely to be successful if they tried (Cummings, 1984). The estimates of current smoking rates must be viewed with caution since many studies report smoking rates only for adults 45 to 64 years and those 65 years and older.

Even though the prevalence rates for this age group are lower than younger age groups, current smokers aged 50-74 are especially at risk from continued smoking because (1) they have smoked longer, and (2) they have been and continue to be heavier smokers (Shopland and Brown, 1985). A higher proportion of smokers in this age cohort smoke more than 25 cigarettes a day and smoke high and very high nicotine brands (Remington *et al.*, 1985; Moss, 1979). The highest proportion of smokers are men who were born between 1910 and 1930 and thus now are aged 50 and older (Cummings, 1984). Little evidence exists that the percent of smokers in the older (65+) age subgroup has decreased over time (Havlik, 1987). Since one

in four persons will be aged 55 and older by 2010, the implications of these smoking rates are profound.

B. Need for Targeted Smoking Cessation Programs

While there are many available smoking cessation programs, none that is described in the published literature has been directed specifically at older adults (Bosse and Rose, 1984). Smoking cessation for older adults was not explicitly included in a number of prominent health promotion programs for older adults (FallCreek and Mettler, 1980; Kemper et al., 1981; FallCreek and Stam, 1982; Nelson et al., 1986). One program guide (FallCreek and Mettler, 1980) includes brief background information about the benefits and risks of smoking and resources for smoking cessation programs that can be used by program planners.

Simplistic generalizations from studies of young and middle-aged adults to the old are fraught with difficulty (Rowe, 1985). Thus, simply using existing smoking cessation strategies without appropriate age-tailoring may fall short of the desired impact. To reflect this, smoking cessation messages and programs should be tailored to the special needs of older smokers and reflect the physiologic, psychosocial and pathologic impacts of aging (Rowe, 1985).

Quit rates might be improved with programs that address age-related quitting barriers and emphasize age-related quitting incentives. Little is known about how older people make the decision to quit, how they quit and what withdrawal symptoms they experience. Some withdrawal reactions (e.g., sleeplessness, constipation and impaired concentration) might be especially disconcerting for older smokers, and little is known about this, either.

Obstacles that are likely to be faced by older smokers include: greater pessimism about their ability to quit--a consequence of their greater number of quit attempts (e.g., Remington et al., 1985); their longer smoking history and tendency to be heavier, more addicted smokers (Remington et al., 1985, Moss, 1979; Shopland and Brown, 1985); possible shielding from strengthening nonsmoking norms and influences in the workplace (USDHHS, 1986b); and doubt/pessimism about the benefits of quitting and pessimism about cancer prevention in general (USDHHS, 1987). Older adults also may be more fatalistic about taking health risks, because they do not perceive personal harm from these risks. For example, focus group participants in Philadelphia mentioned that they had been smoking many years, and they were in good health. Thus, they felt they had no incentive to quit (Rimer, research in progress). In addition, smokers 65 years of age and older are less knowledgeable about the health effects of smoking; they are somewhat less likely than younger smokers to recognize that smoking is related to cancers of the larynx, esophagus and lung and chronic bronchitis (Shopland and Brown, 1987). Older smokers also are less likely than younger smokers to be told by their physicians to quit, unless they present with smoking-related illness or symptoms (Ockene et al., 1985).

Nevertheless, older adults may be more receptive to cessation messages than younger audiences due to their increased susceptibility to the health consequences of continued smoking. Special quitting incentives for older adults should include: greater concern with health protection (USDHHS, 1987); desire to remain independent; greater immediacy of smoking health risks; exposure to friends and relatives with smoking-related illnesses; greater physician contact (Dzegede et al., 1981; Doremus Porter Novelli, 1987), the benefits of cumulative learning over repeated quit attempts (e.g., Schacter, 1982) and higher

prevalence of smoking-related illnesses and chronic conditions, which have been shown to be among the most powerful quitting motivators (Pederson and Lefcoe, 1976).

Serious illness adds weight to the physician's message and is related to a greater likelihood of successful quitting (USDHHS, 1984a; Ockene et al., 1987). Studies conducted among pulmonary and cardiac patients show that the presence of disease appears to be an important precursor of compliance. The more severe the disease, the more likely patients are to follow their physician's advice (Schwartz, 1987). Most notably, survivors of a myocardial infarction have cessation rates averaging 50% (USDHHS, 1984a). Because older smokers are more likely to quit in the presence of respiratory and/or cardiac disease (Schwartz, 1987), clear demonstration of personal harm might increase perceived susceptibility to smoking-related diseases and, thus, the likelihood of quitting. For example, demonstration of lung effects using a carbon monoxide analyzer might raise perceived susceptibility and make older people more receptive to the quitting message.

V. SMOKING CESSATION STRATEGIES THAT APPEAR PROMISING FOR OLDER ADULTS

A. Introduction

Older smokers may need special help in quitting smoking because they tend to be long-term, heavier smokers. The variety of smoking cessation methods have been reviewed comprehensively, most recently by Schwartz (1987). These include self-help, medication such as Nicorette[®], hypnosis, educational approaches, clinics and groups, physician counseling and mass media and community trials. Some of these methods are likely to be more appropriate for older adults than others.

There is now substantial evidence that several factors improve success in quitting, e.g., use of multiple cessation methods, presence of illness or risk factors which enhance motivation to quit and good maintenance procedures for long-term support (Schwartz, 1987). The most promising approaches are based on social learning, that is, they treat smoking as a learned behavior in which the would-be quitter must learn to manage the antecedents and consequences of smoking (Lichtenstein and Brown, 1980). The most successful strategies are likely to be those that are woven into a smoker's regular environment--the medical care setting,, workplace, school and media (Ockene et al., 1987).

Kottke et al. (1987) conducted a meta-analysis to examine 108 intervention comparisons in 39 controlled smoking cessation trials. They concluded that the program with the best results six months after the initiation of intervention would be one in which both physicians and non-physicians used multiple intervention modalities to deliver individualized face-to-face interventions on multiple occasions (Kottke et al., 1987). The authors argued that ways should be found to increase the frequency, variety and ubiquity of smoking cessation messages (Kottke et al., 1987).

What is not known are what kinds of programs will be most effective for older adults. Not only are older adults not studied systematically; the data often are not presented in such a way as to permit age-related generalizations to be made.

In the next section, some of the promising strategies that can be adapted for older adults are reviewed briefly, and have been grouped according to broad

categories: (1) self-help, which may be introduced to the prospective quitter in a variety of ways; (2) clinical interventions; (3) physician-mediated interventions; (4) mass media, which have been used for a range of purposes, from simply raising awareness to teaching specific quitting techniques; and (5) community and worksite-based strategies, which take advantage of social relationships.

B. Potential of Self-Help Cessation Methods Among Older Adults

Self-help treatment approaches have potential cost-effectiveness and wide appeal to Americans. Most smokers attempting to quit do so without outside help: 95% of America's 32 million ex-smokers have quit on their own (Horn, 1978), and most current smokers express a preference for self-help quitting instructions, books and aids over formal face-to-face clinic and counseling approaches (Schwartz and Dubitzky, 1967). The vast majority of smokers are unwilling to enroll in organized cessation programs (Cohen *et al.*, 1987). The 1982 Surgeon General's Report (USDHHS, 1982) concluded that the preferences of smokers and the unaided efforts of most who have quit point clearly to the desirability of effective self-help programs in smoking cessation. Abstinence rates for self-help programs range from 5% to 40% and may be enhanced with brief health professional interventions (Janz *et al.*, 1987). Older focus group participants in Philadelphia expressed a clear preference for self-help over group methods (Rimer, research in progress).

However, most self-help methods are not oriented to older smokers, and it is not known whether the techniques that are appropriate for younger smokers will be effective for older smokers. Research is needed to identify the most acceptable self-help strategies and messages for older people. For example, it is likely that the reasons for quitting may vary with the age of the smoker. Smoking cessation manuals typically show young and middle-aged adults and provide examples that are more relevant to these groups as well.

Self-help packages should include several features to promote adherence, including age-tailored quitting advice and reinforcement. Besides examining standard smoking history, psychosocial and health-related predictors and other variables, a range of subject and intervention characteristics that may influence adherence to the recommended self-quitting strategies should be examined. Self-help strategies must include age-tailored advice. The new American Lung Association (ALA) self-help smoking cessation guide, Freedom From Smoking^R For You and Your Family (Strecher and Rimer, 1987), contains age-related exercise recommendations. But other tailoring could be done, as well. For example, many older people may lack the social support networks accessible to younger adults, e.g., at work, but may have others. The temptations they face may be different, and certainly the appropriate alternatives to smoking must be age-appropriate.

The impact of self-help methods for older adults could be enhanced through mailed and telephone reinforcements delivered to older adults in their homes to cue and reinforce behavioral change and its maintenance. Research shows the promise of such interventions as potentially cost-effective means of boosting quit rates by providing longer-term reinforcement (e.g., Janis, 1983; Orleans *et al.*, 1986).

Boosting the number and success of self-guided quit attempts through widescale cost-effective programs to aid self-quitters is a priority for national smoking

control (Greenwald et al., 1987)--a critical strategy in the effort to achieve the nation's cancer control objectives for the Year 2000.

C. Clinical Interventions

The most effective programs are broad-spectrum, involving multicomponent treatments that incorporate behavioral, cognitive and aversive approaches (Ockene et al., 1987). The programs are based upon strategies of teaching new coping skills or enhancing old ones and preventing relapse. According to Ockene et al. (1987), the best outcomes and greatest potential are evidenced by multicomponent packages that include psychological, behavioral, social and physiological approaches.

D. Reaching Older Adults Through Physician Offices

The Surgeon General (USDHHS, 1982) concluded that brief and simple advice by a physician to quit smoking is a relatively inexpensive way to help people quit. Most adult smokers claim they never have been told to stop smoking by their physicians (Cummings et al., 1987; Cohen et al., 1987). Although United States physicians view smoking as an extremely serious health risk and feel responsible for helping their patients quit, only two-thirds advise most of their patients to quit, and fewer than one-fourth offer any kind of structured assistance in helping them quit (Orleans, 1985).

Currently, 30% of the practice of internists and medical subspecialists is devoted to older people, and this may increase to 50% within the next 20 years (Stults, 1984). More than 16% of the total physician visits during 1983 were made by persons aged 65 and over. The average American 50-74 years makes 4.5 ambulatory visits per year and those 65 years and older make 6.3 visits per year (Rice and Estes, 1984). Thus, there are millions of potential encounters in which the smoking issue can be raised and dealt with and in which reinforcement can be provided. Even a modest level of impact, such as the six percent cessation rate obtained by counseling alone (Russell et al., 1983), could translate to significant reductions in smoking-related morbidity and mortality among older adults.

Although adults 60 years of age and older report that they are more likely to follow a doctor's orders than younger people (USDHHS, 1986d), physicians spend less time with older patients (Kane et al., 1980) and are less likely to give a strong cessation message to older adults (Ockene et al., 1985).

Physicians' offices are among the most important potential sites for smoking cessation activities directed at older adults (Hazzard, 1983; Fletcher, 1984). Schwartz (1987) reviewed 28 physician intervention trials. Among trials reporting one year follow-up, the median rate for counseling alone was six percent; this increased to 22.5% when the intervention went beyond counseling and climbed to 32% and 43% for pulmonary and cardiac patients. In one of the most promising studies, Russell et al. (1983) found quit rates of 10%, 14% and 20% for control, advice to quit and advice plus nicotine gum, respectively. Li et al. (1984) also showed that brief physician counseling can be effective--8% quit rates compared to 4% for simple warnings. Thus, there is clear evidence that, especially when the proper support is added to physician counseling, physician-mediated interventions can be quite powerful.

Primary care interventions should include five steps: (1) identifying smokers, (2) giving brief, personalized quit-smoking advice, (3) introducing the

treatment, (4) setting a quit date and follow-up dates and (5) assisting patients to recycle through the same treatment or to try a more intensive or specialized treatment in the event of a relapse or setback (e.g., NCI, 1987; Orleans, 1986, in press; Orleans et al., 1987). These are consistent with the recommendations of the US Preventive Services Task Force. A number of good summary articles and manuals now are available to help physicians advise smokers (e.g., Danaher et al., 1980; Windsor et al., 1980; Working Group on Physician Behaviors To Reduce Smoking Among Hypertensive Patients, 1983; Sachs, 1984; Orleans, 1985; Hughes and Kottke, 1986; USDHHS, 1986a). However, only one of these guides includes age-related guidelines for quitting smoking (USDHHS, 1986a).

Self-help materials and Nicorette^R gum are two strategies that can be combined effectively with brief physician intervention. Self-help quitting strategies are well suited to diffusion through the health services sector. Quit rates from self-help manuals are likely to be higher when they are provided after personal medical advice to quit (e.g., Janz et al., 1987). Providing nicotine gum at no cost may markedly improve the rates at which physicians counsel patients about smoking (Cohen et al., 1987), although it is likely that Nicorette^R will be contraindicated for many older adults. Helping physicians to develop reminder systems also will increase the proportion of patients whom they counsel (Cohen et al., 1987).

The physician-mediated intervention is one of the most promising smoking-cessation strategies for older adults. Physicians are credible sources of health information, and the cessation message can be integrated logically within the continuing health care of older adults.

B. Reaching Older Smokers in Community and Worksite Settings

Community-based interventions are based, in part, upon the hypothesized importance of social factors in quitting and continued abstinence and the potential for changing smoking norms (Ockene et al., 1987). An additional benefit of the community setting for older adults is that they can be reached where they live. A number of community intervention studies have been conducted or are in process, for example, North Karelia, Stanford Three-Community, Pawtucket Heart Health and the Minnesota Heart Health Program (Farquhar et al., 1977; Puska et al., 1983; Blackburn et al., 1984; Lasater and Carleton, 1985). These programs have demonstrated reductions in smoking; they have been most effective when intensive, multi-strategy and occurred over a long period of time (Ockene et al., 1987).

A number of community organizations can be utilized to promote smoking cessation programs for older adults. Twenty million Americans belong to the American Association of Retired Persons (AARP), and many of them can be reached through local chapters which can be used to offer the smoking cessation message, provide self-help materials and track older adults into more intensive interventions, if needed. Also, in view of the large proportion (75%) of older people who are members of a church or synagogue and claim to attend church regularly (49%) (Gallup Poll, 1981), religious groups offer another logical delivery site for health promotion activities for older adults. Such programs can produce positive changes in health-related knowledge, beliefs and behaviors (Rimer et al., 1986a). Voluntary health agencies, senior centers and public health clinics also can be important intermediaries in delivering such programs. Reaching older people with health information as they attend their usual activities in the community may be a cost-effective alternative to more extended

group programs, which may produce positive changes but can reach only a relative few and at greater cost.

Worksites offer another means to provide environmental and social support to older smokers. Kiefhaber and Goldbeck (1986) noted that older workers, their spouses and retired employees are three groups that can be reached through worksite wellness programming. Pre-retirement groups may offer the opportunity to reach workers at an important transition point in their lives, when they may be receptive to health information and willing to change their behavior. It is estimated that more than 75% of the Fortune 500 firms should have pre-retirement programs in place by 1989 (Siegel, 1986). Smoking and other health promotion topics can be integrated within these programs.

F. Mass Media Approaches

The mass media may offer important channels for communicating the message, "you are never too old to quit." A large majority of older people read newspapers regularly, and they are heavy viewers of television. The mass media could be used to raise older adults' awareness regarding the relationship between smoking and disease and to encourage them to ask their physicians about smoking. Although there have been some relatively successful mass media smoking cessation programs (Schwartz, 1987), person-to-person communication appears to be a necessary part of efforts to reduce smoking and maintain cessation (USDHHS, 1984b). Green and McAlister (1984) concluded that the mass media are not likely to have much effect at the point of public health program diffusion unless their social objectives are reinforced by families, peer groups and other formal and informal community systems.

In addition, smoking cessation messages must compete with a host of other concerns for Public Service Announcement placement. Messages about older people then would compete with messages aimed at other high-risk audiences. Furthermore, smoking cessation messages in the print media are far outweighed by pro-use advertisements sponsored by the tobacco companies. Careful planning at the national and local level can help to overcome some of these barriers.

The media, then, remain a necessary but not sufficient component of smoking cessation programs aimed at older adults. They might be used most effectively in raising older adults' awareness about the consequences of continued smoking and the benefits of cessation and providing linkage to self-help materials (Dubren, 1977; Best, 1980; Puska et al., 1981).

VI. RECOMMENDED SMOKING CESSATION APPROACHES

Several approaches can be used in designing specific smoking cessation messages to reach older adults. These include:

- Provide more vivid information. Techniques like case studies and photovignettes can be used to heighten vividness and to increase the salience of the cessation message for older adults (Nisbett and Ross, 1980).
- Promote "peace of mind" as a major benefit. This message can be used to encourage smokers to seek help and to provide a sustained rationale for quitting.

- Highlight the relationship between smoking and medical and potential medical problems. These are critical motivating factors for stopping smoking, especially for older adults. The message should include clear, direct evidence that older adults can be harmed by continued smoking and gain significant benefits by cessation.
- Use reliance on physicians as a basis for action. Older adults could be encouraged to "ask your doctor how to quit smoking" or "talk to your doctor about your smoking." Physician messages should be unequivocal. A "clean bill of health" for an older smoker is perceived as an endorsement for continued smoking (Rimer, research in progress). Credible physicians, the Surgeon General, for example, could be important mediators in conveying the importance of cessation to older adults through the mass media and practicing physicians.
- Provide specific information. Behavioral research, (e.g., Leventhal et al., 1965; Zimmerman et al., 1986) suggests that adults are more likely to perform a recommended health behavior when specific information is provided. There is every reason to believe that this applies to older as well as younger adults. Information about why to quit, how to quit and where to get help should be translated into specific action instructions.

The information should be relevant to and individualized to older adults, and, where possible, include feedback and reinforcement (Green, 1984; Hoyt and Janis, 1975; Orleans et al., 1986).

VII. POLICY IMPLICATIONS AND FUTURE DIRECTIONS

The scientific evidence suggests that older adults experience significant harm from continued smoking and can reap substantial benefits from quitting. The strongest empirical support is for a focus on adults 55-75 years old where the health benefits of cessation are clearest.

In order to improve the quantity of quality of smoking cessation efforts directed at older adults, changes must occur on many levels. These include data collection, financing and the development and evaluation of interventions. In this final section, questions and issues related to these areas will be raised.

Reliable data on the smoking behavior and related health practices of older adults are scant. Problems with many of the current national and local studies of smoking behavior are that: the population is subdivided into large, unwieldy categories, and adults 65 years and older are treated as a homogeneous unit. At the very least, national studies should report the smoking practices of older adults in quintiles. This will provide the only reasonable basis for assessing current and tracking future smoking behavior among older adults. Classifying older adults as 65 years and older is simply not helpful in this regard. Other means of rectifying deficiencies in data collection and reporting should be considered, as well.

A cursory review of the mean age for many of the well-known smoking cessation studies suggests that older adults are not being recruited. Researchers could be encouraged to recruit older people into smoking cessation studies and to provide detailed information on age-related quit rates, as well as process data about quitting experiences.

We also must examine ways in which incentives can be built into our financing systems to encourage improved health promotion practices for older adults. Somers (1984) has suggested several options related to Medicare. Public and private insurance mechanisms for improving prevention services should be considered.

As an alternative or an addition to financing incentives for prevention, should cigarette excise taxes be raised, with part of the revenue devoted to provide for the medical care costs associated with smoking (Loeb et al., 1984)? This would also shift the burden of smoking-related diseases onto smokers themselves. This strategy raises a number of social and ethical questions concerning who is responsible and who pays. On the one hand, payment would be shifted to those responsible for the costs. On the other hand, shifting costs might be distasteful to some, because smoking has become more and more a habit of less affluent Americans (USDHHS, 1986b) who might be regarded as having fewer choices about their risk-taking behavior. Thus, they might be seen as bearing a disproportionate burden. Nevertheless, as Bayer and Moreno (1986) argued, the tendency to place greater and greater obligations on society for the provision of health care through third-party mechanisms means that the burden has become increasingly communal. This should challenge us to develop solutions that are ethically acceptable.

As this review has shown, older adults have not been a focus for smoking cessation efforts. How can smoking cessation interventions be integrated within the usual delivery of health care services to older adults. How can practitioners and researchers be encouraged to reach out to meet the special needs of older adults? Would it not be helpful to educate physicians and their staffs about how to counsel older adults to change health behaviors, such as smoking? They could be helped to implement simple reminder systems, such as that developed by Cohen et al. (1987). At the very least, physicians should act as positive role models for nonsmoking behavior, and their offices should be smoke-free zones (USDHHS, 1984b).

Multidisciplinary teams of smoking cessation experts and educational gerontologists might examine some of the most promising self-help smoking cessation manuals and recommend how to tailor them to meet the quitting needs of older adults. The efficacy of these tailored guides, with and without other supports, such as mailed and telephone reinforcements and physician counseling, could be tested. Self-help programs could be mediated by voluntary health organizations and by other organizations interested in meeting the health needs of older adults.

No one approach to cessation is sufficient. A recent National Cancer Institute (NCI) report concluded that there is ample evidence to suggest that the cumulative effect from a number of interventions on an individual's smoking behavior is greater than the effect from any one intervention (NCI, 1987). This is an important conclusion, because it means that multiple messages do not have a deadening or desensitizing effect, as has sometimes been thought. Thus, there must be attempts to reach older adults with the quitting message through the mass media, self-help, the organizations to which they belong, the physicians from whom they seek care, by introducing inducements for prevention into government financing systems, and, finally, by changing social norms regarding smoking and older adults.

Acknowledgments: CT Orleans, PhD contributed to the section on rates of smoking in older people. Thanks to L Fleisher, MPH and B Glassman, MA for editing and K Smith for wordprocessing.

VIII. CITATIONS AND REFERENCES

1. Achkar, E. Peptic Ulcer Disease: Current Management in the Elderly. *Geriatrics* 1985; 40: 77-79, 82-83.
2. Abramson, JH. Prevention of Cardiovascular Disease in the Elderly. *Public Health Rev* 1985; 13: 165-233.
3. Anderson, WF. Is Health Education for the Middle-Aged and Elderly a Waste of Time? In T Wells (ed), *Aging and Health Promotion*. Rockville, MD: Aspen Systems Corporation, 1982.
4. Barbaro, EL, Noyes, LE. A Wellness Program for a Life Care Community. *Gerontologist* 1984; 24: 568-571.
5. Bayer, R, Moreno, JD. Health Promotion: Ethical and Social Dilemmas of Government Policy. *Health Aff* 1986; 5: 72-85.
6. Benfante, R, Reed, D, Brody, J. Biological and Social Predictors of Health in an Aging Cohort. *J Chronic Dis* 1985; 38(5): 385-395.
7. Best, JA. Mass Media, Self-Management, and Smoking Modification. In PO Davidson and SM Davidson (eds) *Behavioral Medicine: Changing Health Lifestyles*. New York, NY: Brunner/Mazel, Inc., 1980. pp. 371-390.
8. Blackburn, H, Luepker, R, Kline, F et al. The Minnesota Heart Health Program. In S Weiss, J Matarazzo, N Miller et al. (eds) *Behavioral Health: A Handbook for Health Enhancement and Disease Prevention*. New York, NY: John Wiley and Sons, Inc., 1984.
9. Bolten, CR, Ball, J. Understanding Health in Old Age: A Role for the Health Educator. *Health Education* 1983; 14: 36-38.
10. Bosse, R, Rose, CL (eds). *Smoking and Aging*. Lexington, MA: DC Heath and Company, 1984.
11. Brodzka, W, Thornhill, HL, Howard, S. Burns: Causes and risk factors. *Arch Phys Med Rehabil* 1985; 66: 746-752.
12. Burman, LA, Norrby, R, Trollfors, B. Invasive Pneumococcal Infections. *Rev Infect Dis* 1985; 7: 133-142.
13. Burr, ML, Phillips, KM, Hurst, DN. Lung Function in the Elderly. *Thorax* 1985; 40: 54-59.
14. Cohen, SJ, Christen, AG, Katz, BP et al. Counseling Medical and Dental Patients about Cigarette Smoking. *Am J Public Health* 1987; 77: 313-316.
15. Cummings, KM. Changes in the Smoking Habits of Adults in the United States and Recent Trends in Lung Cancer Mortality. *Cancer Detect Prev* 1984; 7: 125-134.
16. Cummings, KM, Giovino, G, Sciandra, R et al. Physician Advice to Quit Smoking: Who Gets It and Who Doesn't. *American Journal of Preventive Medicine* 1987; 3: 69-75.
17. Danaher, BG, Ellis, BH, Farquhar, JW. How To Help Smokers Who Want To Quit. *Patient Care* 1980 August 15; 86-121.
18. Doremus Porter Novelli. Focus Groups on Preventive Health Care For Older Persons. Prepared for Office of Disease Prevention and Health Promotion and American Cancer Society, August 1987.
19. Dubren, R. Evaluation of a Televised Stop-Smoking Clinic. *Public Health Rep* 1977; 92: 81-84.
20. Dzegede, SA, Hackworth, JR, Pike, SW. Factors that Differentiate Smokers from Exsmokers in a Florida Metropolitan Area. *Public Health Rep* 1981; 96(4): 326-334.
21. FallCreek, S, Mettler, M. *A Healthy Old Age: A Sourcebook for Health Promotion with Older Adults*. Seattle, WA: University of Washington, 1980.
22. FallCreek, S, Stam, SB. *The Wallingford Wellness Project*. Seattle, WA: University of Washington (Monograph No.2), 1982.
23. Farquhar J, Maccoby N, Wood P, et al. Community education for cardiovascular health. *Lancet* 1977; *i*: 1192-1195.
24. Fielding, JE. Smoking: Health Effects and Control (First of Two Parts). *N Engl J Med* 1985a; 313(8): 491-498.

25. Fletcher, DJ. Promotion Health in Elderly Patients. *Geriatric Consultant* 1984; 2(4): 26-29.
26. Gallup Poll. Gallup Opinion Index. 1981.
27. Gordon, NP, Cleary, PD. Smoking Cessation in a National Probability Sample Cohort 1979-1980. The Institute for the Study of Smoking Behavior and Policy, John F. Kennedy School of Government, Harvard University. October 1986, Unpublished Manuscript.
28. Gordon, T, Kannel, W, McGee, D. Death and Coronary Attacks in Men Giving Up Cigarette Smoking. *Lancet* 1974; 2: 1345-1348.
29. Graham, S, Levin, ML. Smoking Withdrawal in the Reduction of Risk of Lung Cancer. *Cancer* 1971; 27(4): 865-871.
30. Green, LW. Modifying and Developing Health Behavior. In L Breslow (ed), *Annual Review of Public Health (Volume 5)*. Palo Alto, CA: Annual Reviews, Inc., 1984.
31. Green, LW. Some Challenges to Health Services Research on Children and the Elderly. *Health Serv Res* 1985, Part II; 19(6): 793-815.
32. Green, LW, McAlister, AL. Macro-Intervention to Support Health Behavior: Some Theoretical Perspectives and Practical Reflections. *Health Educ Q* 1984; 11:322-339.
33. Greenblatt et al. Drug Disposition in Old Age. *N Engl J Med* 1982; 306: 1081-1088.
34. Greenwald, P, Cullen, JW, McKenna, JW. Cancer Prevention and Control From Research Through Applications. *JNCI* 1987; 79: 389-400.
35. Havlik, RJ. Determinants of Health--Cardiovascular Risk Factors. In *Vital and Health Statistics (Series 3, No. 25)*. Washington, DC: USGPO, 1987. pp. 37-40.
36. Hazzard, WR. Preventive Gerontology: Strategies for Healthy Aging. *Preventive Gerontology* 1983; 74(2): 279-287.
37. Heckler, MM. Health Promotion for Older Americans. *Public Health Rep* 1985; 100(2): 225-230.
38. Heidrich, F, Thompson, RS. Osteoporosis Prevention: Strategies Applicable for General Population Groups. *J Fam Pract* 1987; 25: 33-39.
39. Hershey, JC, Probst, J, Portnoy, B. An Evaluation of a National Health Promotion Campaign. Report to the Office of Health Information, Health Promotion, and Physical Fitness, and Sports Medicine (Contract No. 282-80-0056-SHP), Kappa Systems, Inc., 1982.
40. Horn, D. Who is Quitting--and Why? In JL Schwartz (ed) *Progress in Smoking Cessation: Proceedings, International Conference on Smoking Cessation*. New York, NY: American Cancer Society, 1978. pp. 27-32.
41. Howard, G, Toole, JF, Frye-Pierson, J. Factors influencing the survival of 451 transient ischemic attack patients. *Stroke* 1987; 18: 552-557.
42. Hoyt, MF, Janis, IL. Increasing Adherence to a Stressful Decision via a Motivational Balance Sheet Procedure: A Field Experiment. *J Pers Soc Psychol* 1975; 31: 833-839.
43. Hughes, JR, Kottke, T. Doctors Helping Smokers: Real World Tactics. *Minn Med* 1986; 69: 293-295.
44. Jajich, CL, Ostfeld, AM, Freeman, DH. Smoking and Heart Disease Mortality in the Elderly. *JAMA* 1984; 252(20): 2831-2834.
45. Janis, I. The Role of Social Support in Adherence to Stressful Decisions. *Am Psychol* 1983; 38: 143-160.
46. Janz, NK, Becker, MH, Kirscht, JP et al. Evaluation of a Minimal-Contact Smoking Cessation Intervention in an Outpatient Setting. *Am J Public Health* 1987; 77(7): 805-809.
47. Kane, R, Solomon, D, Beck, J et al. The Future Need for Geriatric Manpower in the United States. *N Engl J Med* 1980; 302: 1327-1332.
48. Kane, RL, Kane, RA, Arnold, SB. Prevention and the Elderly: Risk Factors. *Health Serv Res* 1985, Part II; 19(6): 945-1006.

49. Kemper, DW, Deneen, EJ, Giuffre, JV. Growing Younger Handbook. Boise, ID: Healthwise, Inc., 1981.
50. Kiefhaber, AK, Goldbeck, WB. Worksite Wellness. In K Dychtwald, J MacLean (eds), Wellness and Health Promotion for the Elderly. Rockville, MD: Aspen Publication, 1986. pp. 147-164.
51. Kirchman, MM, Reichenbach, V, Giambalvo, B. Preventive Activities and Services for the Well Elderly. Am J Occup Ther 1982; 36: 236-242.
52. Kottke, TE, Battista, RN, DeFriese, GH et al. Attributes of Successful Smoking Cessation Interventions in Medical Practice. Prepared for the United States Preventive Services Task Force, 1987.
53. Leventhal, H, Jones, S, Singer, R. Effects of Fear and Specificity of Recommendation Upon Attitudes and Behavior. J Pers Social Psychol 1965; 2: 20-29.
54. Leviton, D, Santa Maria, L. The Adults' Health and Development Program: Descriptive and Evaluative Data. Gerontologist 1979; 19: 534-543.
55. Li, VC, Kim, YJ, Ewart, CK et al. Effects of Physician Counseling on the Smoking Behavior of Asbestos-Exposed Workers. Prev Med 1984; 13: 462-476.
56. Lichtenstein, E, Brown, RA. Smoking Cessation Methods: Review and Recommendations. In WR Miller (ed), The Addictive Behaviors. New York, NY: Pergamon Press, 1980. pp. 169-206.
57. Lidoff, L, Beaver, L. Peer Groups for Health Education. Washington, DC: National Council on Aging, 1982.
58. Loeb, LA, Ernster, VL, Warner, KE et al. Smoking and Lung Cancer: An Overview. Cancer Res 1984; 44: 5940-5958.
59. Lorig, K, Kraines, R, Holman, H. A Randomized Prospective, Controlled Study of the Effects of Health Education for People with Arthritis. Presented at the American Rheumatism Association Meeting, Boston, MA, 1981.
60. Lubin, YH, Blot, WJ, Berrino, F et al. Modifying Risk of Developing Lung Cancer by Changing Habits of Cigarette Smoking. Br Med J 1984; 288: 1953-1956.
61. Mallamad, SS, Eisner, EJ, Ostrove, N. Health Promotion and the Elderly. Washington, DC: Porter, Novelli & Associates, 1984.
62. Mason, GR, Uszler, JM, Effros, RM et al. Rapidly Reversible Alterations of Pulmonary Epithelial Permeability Induced by Smoking. Chest 1983; 83(1): 6-11.
63. Mellstrom, D, Rundgren, A, Jagenburg, R et al. Tobacco Smoking, Ageing and Health Among the Elderly: A Longitudinal Population Study of 70-Year-Old Men and an Age Cohort Comparison. Age Ageing 1982; 11: 45-58.
64. Melton, LJ, Riggs, BL. Letter to the Editor. N Engl J Med 1986; 314(3): 181.
65. Mitchell, RS, Judson, FN, Moulding, TS et al. Health Effects of Urban Air Pollution: Special Consideration of Areas at 1,500 m and Above. JAMA 1979; 242(11): 1163-1168.
66. Moore, SR. Smoking and Drug Effects in Geriatric Patients. Pharmacy International 1986; 7(1): 1-3.
67. Moore, SR, Kalu, M, Yavaprabbas, S. Receipt of Prescription Drug Information by the Elderly. Drug Intell Clin Pharm 1983; 17: 920-923.
68. Morisky, DE, Levine, DM, Green, LW et al. Health Education Program Effects on the Management of Hypertension in the Elderly. Arch Intern Med 1982; 142: 1835-1838.
69. Moss, AJ. Changes in Cigarette Smoking and Current Smoking Practices Among Adults: United States 1978. Advance Data 1979; 52: 1-15.
70. National Cancer Institute, Smoking, Tobacco, and Cancer Program. Presented to the Board of Scientific Counselors, Division of Prevention and Control, National Cancer Institute, September 22, 1987.
71. Nelson, EC, McHugo, G, Schnurr, P et al. Medical Self-Care Education for

- Elders: A Controlled Trial to Evaluate Impact. *Am J Public Health* 1984; 74: 1357-1362.
72. Nelson, EC, Roberts, E, Simmons, J et al. *Medical and Health Guide For People Over Fifty*. Washington, DC: American Association of Retired Persons, 1986.
 73. Nisbett, R, Ross, L. *Human Inference: Strategies and Shortcomings of Social Judgment*. Englewood Cliffs, NJ: Prentice-Hall, 1980.
 74. Ockene, J, Williams, J, Hosmer, D et al. *Factors Affecting Patients' Smoking and Physicians' Intervention Practices*. Presented at the Society of Behavioral Medicine Meeting, San Francisco, CA, November 1985.
 75. Ockene, JK, Hosmer, DW, Williams, JW et al. *Factors Related to Patient Smoking Status*. *Am J Public Health* 1987, 77: 356-357.
 76. Office of Disease Prevention and Health Promotion. *Aging and Health Promotion Marketing Research for Public Education*. Arlington, VA: SRA Technologies, Inc. (PHS B84-211150), 1984.
 77. Office of Disease Prevention and Health Promotion. *Healthy Older People Program Memo (USDHHS, PHS) 1987; 2(1)*.
 78. Office of Disease Prevention and Health Promotion. *Smoking Cessation for Older People. Technical Review Notes. (USDHHS, PHS), 1986*.
 79. Office of Technology Assessment, Health Program Office, US Congress. *Smoking-Related Deaths and Financial Costs, Staff Memo, September 1985*.
 80. Orleans, CT. *Essential Elements of a Smoking Cessation Program: Facility Initiated Patient Protocols*. Presented at the National Cancer Institute Conference on a State-of-the-Art Smoking Cessation Program, Bethesda, MD, December 1986.
 81. Orleans, CT. *Smoking Cessation Initiatives in Primary Care Settings. Journal of the Medical Society of New Jersey, in press*.
 82. Orleans, CT. *Understanding and Promoting Smoking Cessation: Overview and Guidelines for Physician Intervention. Annu Rev Med 1985; 36: 51-61*.
 83. Orleans, CT, McCoubrey, C, Short, E et al. *Minimal Telephone Counseling to Promote Self-Guided Smoking Cessation*. Presented at the Meeting of the Association for Advancement of Behavior Therapy, Chicago, IL, 1986.
 84. Orleans, CT, Strecher, V, Thompson, B et al. *Quit For Life*. Durham, NC: North Carolina Mutual Life Insurance Company, 1987.
 85. Oster, G, Colditz, GA, Kelly, NL. *The Economic Costs of Smoking and Benefits of Quitting for Individual Smokers. Prev Med 1984; 13: 377-389*.
 86. Parsons, PE. *Cost of Health Care. In Vital and Health Statistics (Series 3, No. 25). Washington, DC: USGPO, 1987. pp. 76-79*.
 87. Pathak, DR, Samet, JM, Humble, CG et al. *Determinants of Lung Cancer Risk in Cigarette Smokers in New Mexico. JNCI 1986; 76(4): 597-604*.
 88. Pederson, LL, Lefcoe, NM. *A Psychological and Behavioural Comparison of Ex-Smokers and Smokers. J Chronic Dis 1976; 29: 431-434*.
 89. Prohaska, TR, Leventhal, EA, Leventhal, H et al. *Health Practices and Illness Cognition in Young, Middle Aged, and Elderly Adults. J Gerontol 1985; 40: 569-578*.
 90. Puska, P, McAlister, A, Pekkola, J et al. *Television in Health Promotion: Evaluation of a National Programme in Finland. Intl J Health Ed 1981; 24: 238-250*.
 91. Remington, PL, Forman, MR, Gentry, EM et al. *Current Smoking Trends in the United States: The 1981-1983 Behavioral Risk Factor Surveys. JAMA 1985; 253(20): 2975-2978*.
 92. Rice, DP, Estes, CL. *Health of the Elderly: Policy Issues and Challenges. Health Aff 1984; 25-49*.
 93. Rice, DP, Hodgson, TA, Sinsheimer, P et al. *The Economic Costs of the Health Effects of Smoking, 1984. The Milbank Quarterly 1986; 64(4): 489-547*.

94. Rimer, B, Keintz, MK, Fleisher, L. Process and Impact Evaluation of a Health Communications Program. *Health Education Research* 1986a; 1(1): 29-36.
95. Rimer, B, Keintz, MK, Glassman, B et al. Health Education for Older Persons. In W Ward, Z Salisbury, JG Zapka, SB Kar (eds), *Advances in Health Education and Promotion (Volume 1, Part B)*. Greenwich, CT: JAI Press, Inc., 1986b. pp. 369-396.
96. Rogers, RL, Meyer, JS, Judd, BW et al. Abstention from Cigarette Smoking Improves Cerebral Perfusion Among Elderly Chronic Smokers. *JAMA* 1985; 253(20): 2970-2974.
97. Rowe, JW. Health Care of the Elderly. *N Engl J Med* 1985; 312(13): 827-835.
98. Rowe, JW, Bradley, EC. The Elderly Cancer Patient. In R Yancik (ed), *Perspectives on Prevention and Treatment of Cancer in the Elderly*. New York, NY: Raven Press, 1983.
99. Russell, MAH, Merriman, R, Stapleton, J et al. Effect of Nicotine Chewing Gum as an Adjunct to General Practitioners' Advice Against Smoking. *Br Med J* 1983; 287(6407): 1782-1785.
100. Sachs, DPL. Office Strategies to Help Your Patients Stop Smoking. *J Respir Dis* 1984; 5(2): 35-48.
101. Schacter, S. Recidivism and Self-Cure of Smoking and Obesity. *Am Psychol* 1982; 37: 436-444.
102. Schelling, TC. Economics and Cigarettes. *Prev Med* 1986; 15; 549-560.
103. Schuman, LM. Smoking as a Risk Factor in Longevity. In D Danon, NW Shock, M Marois (eds), *Aging: A Challenge to Science and Society*. Oxford, England: Oxford University Press, 1981. pp. 204-218.
104. Schwartz, JL. Review and Evaluation of Smoking Cessation Methods. Washington, DC: USDHHS (NIH 87-2940), 1987.
105. Schwartz, JL, Dubitzky, M. Expressed Willingness of Smokers to Try Ten Smoking Withdrawal Methods. *Public Health Rep* 1967; 82: 855-861.
106. Shopland, DR, Brown, C. Toward the 1990 Objectives for Smoking: Measuring the Progress with 1985 NHIS Data. *Public Health Rep* 1987; 102(1): 68-73.
107. Shopland, DR, Brown, CD. Analysis of Cigarette Smoking Behavior by Birth Cohort. Presented to the Interagency Committee on Smoking and Health, Washington, DC, 1985.
108. Shultz, JM. Perspectives on the Economic Magnitude of Cigarette Smoking. *NY State J Med* 1985; 85(7): 302-306.
109. Siegel, SR. Preretirement Programs in the '80's. *Personnel Administrator* 1986 February; 77-83.
110. Somers, AR. Why Not Try Preventing Illness as a Way of Controlling Medicare Costs? *N Engl J Med* 1984; 311(13): 853-856.
111. Somerville, K, Faulkner, G, Langman, M. Non-steroidal anti-inflammatory drugs and bleeding peptic ulcer. *Lancet* 1986; 1: 462-464.
112. Sorenson, AW, Seltser, R, Sundwall, D. Primary Cancer Prevention as an Attainable Objective for the Elderly. In R Yancik (ed), *Perspectives on Prevention and Treatment of Cancer in the Elderly*. New York, NY: Raven Press, 1983.
113. Sparrow, D, O'Connor, G, Colton, T et al. The Relationship of Nonspecific Bronchial Responsiveness to the Occurrence of Respiratory Symptoms and Decreased Levels of Pulmonary Function. The Normative Aging Study. *Am Rev Respir Dis* 1987; 135: 1255-1260.
114. Sparrow, DW. The Influence of Aging and Smoking on Pulmonary Function. In R Bosse and CL Rose (eds), *Smoking and Aging*. Lexington, MA: DC Heath and Company, 1984.
115. Special Committee on Aging, United States Senate. *Developments in Aging: 1986, Volume 1*. Washington, DC: USGPO, 1987a. pp. 173-195.

116. Special Committee on Aging, United States Senate. Developments in Aging: 1986, Volume 3. Washington, DC: USGPO, 1987b. p. 10.
117. Strecher VJ, Rimer, B. Freedom From Smoking^R For You and Your Family. New York, NY: American Lung Association, 1987.
118. Stults, BM. Preventive Health Care for the Elderly. West J Med 1984; 141(6): 832-845.
119. Todd, B. Drugs and the Elderly. Cigarettes and Caffeine in Drug Interactions. Geriatr Nurs 1987; 8: 97-98.
120. United States Department of Health, Education and Welfare. Healthy Older Adults. In Healthy People. Washington, DC: USDHEW, 1979. pp. 71-81.
121. United States Department of Health, Education, and Welfare. Vital and Health Statistics: Data From the National Health Survey (Series 10, Number 34), 1967.
122. United States Department of Health and Human Services. Clinical Opportunities for Smoking Intervention: A Guide for the Busy Physician. Washington, DC: USGPO (NIH 86-2178), 1986a.
123. United States Department of Health and Human Services. The Health Consequences of Involuntary Smoking: A Report of the Surgeon General. Washington, DC: USGPO (DHHS (CDC) 87-8398), 1986b.
124. United States Department of Health and Human Services. The Health Consequences of Smoking: Cardiovascular Disease. Washington, DC: USGPO (DHHS (PHS) 84-50204), 1984a.
125. United States Department of Health and Human Services. The Health Consequences of Smoking: Chronic Obstructive Lung Disease: A Report of the Surgeon General. Washington, DC: USGPO (DHHS (PHS) 84-50205), 1984b.
126. United States Department of Health and Human Services. Health, United States: 1980. Hyattsville, MD: Public Health Service (PHS 81-1232), 1980.
127. United States Department of Health and Human Services. A Physician Talks About Smoking: A Slide Presentation. Washington, DC: USDHHS, 1986c.
128. United States Department of Health and Human Services. Prevention in Adulthood. In The Health Consequences of Smoking: A Report of the Surgeon General. Washington, DC: USGPO, 1982. pp. 257-288.
129. United States Department of Health and Human Services. Public Health Service Implementation Plans for Attaining the Objectives for the Nation. Public Health Rep 1983 Supplement to September-October; 1-164.
130. United States Department of Health and Human Services. Technical Report Cancer Prevention Awareness Survey Wave II. Hyattsville, MD: Public Health Service (NIH 87-2907), 1986d.
131. Vestal, RE, Wood, AJJ, Branch, RA et al. Effects of Age and Cigarette Smoking on Propranolol Disposition. Clin Pharmacol Ther 1979; 26(1): 8-15.
132. Vineis, P, Esteve, J, Terracini, B et al. Bladder Cancer and Smoking in Males. Int J Cancer 1984; 34: 165-170.
133. Warner, K. The Economics of Smoking and Lung Cancer. In LA Loeb, VL Ernster, KE Warner et al. Smoking and Lung Cancer: An Overview. Cancer Res 1984; 44: 5940-5958.
134. Windsor, RA, Green, LW, Roseman, JM. Health Promotion and Maintenance for Patients with Chronic Obstructive Pulmonary Disease: A Review. J Chronic Dis 1980; 33: 5-12.
135. Working Group on Health Education and High Blood Pressure Group. The Physician's Guide: Improving Adherence Among Hypertensive Patients. Washington, DC: USDHHS, 1987.
136. Working Group on Physician Behaviors. The Physician's Guide: How to Help Your Hypertensive Patients Stop Smoking. Washington, DC: USDHHS (NIH 83-1271), 1983.
137. Zimmerman, RS, Safer, MA, Leventhal, H et al. The Effects of Health Information in a Worksite Hypertension Screening Program. Health Educ Q 1986; 13(3): 261-280.