CLINICS IN GERIATRIC MEDICINE

Clin Geriatr Med 19 (2003) 77–100

Smoking cessation in the elderly

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David Kessler has described tobacco addiction as a pediatric disease: "...while the epidemic of disease and death from smoking is played out in adulthood, it begins in childhood" [1]. Indeed, virtually all smokers start as teenage children (Fig. 1) [2], and although many, perhaps most, fully intend to quit as they grow older, the vast majority find themselves unable to do so. For older people, the consequences are too often months or years of unrelenting suffering, leading to premature death.

Now, nearly 40 years after the first Surgeon General's report on cigarette smoking, 10.5% of American men and 10.7% of American women aged 65 or older still smoke cigarettes (1999 data; Fig. 2) [3]. They do so despite widespread public knowledge of the pivotal role of smoking in cardiovascular, cerebrovascular, pulmonary, and neoplastic diseases, and at a time when smoking is more expensive and less socially acceptable than formerly. Most smokers (at least 70%) see the value of quitting, and most have made at least cursory efforts to do so. Many manage to quit, often after several unsuccessful attempts.

Today's older smokers represent the hard-core smokers who do not want to quit, who are so thoroughly addicted that they cannot quit even though they want to, who are so habituated to smoking as a daily part of their lives that they cannot imagine living without cigarettes, or who believe that they are already so irreversibly damaged by smoking that quitting would accomplish no purpose. For these people, then, assistance with smoking cessation is a particularly difficult challenge.

Nonetheless, the benefits that older smokers derive from quitting are so substantial that all clinicians should actively and regularly challenge their patients to do so. Making such an effort often bears fruit [4]. Patients who successfully

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PII: S0749-0690(02)00053-8

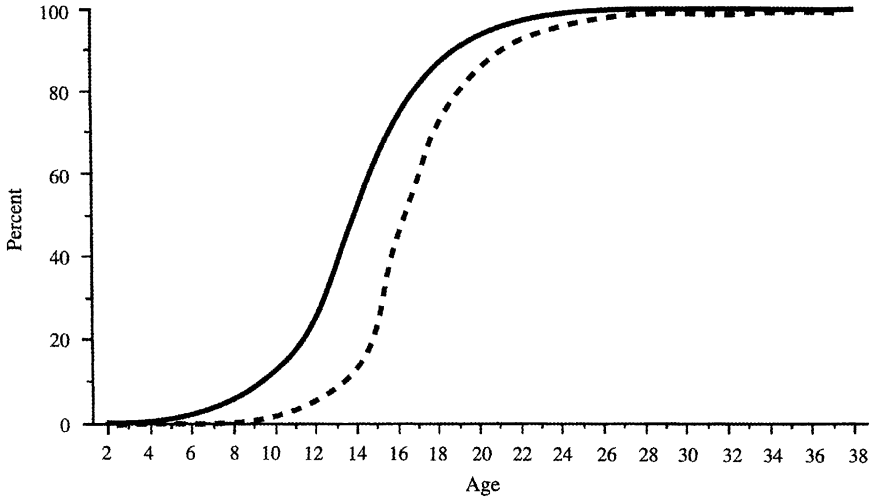

Fig. 1. Cumulative age of initiation of cigarette smoking in the United States in 1991. The solid line is the age of first trying a cigarette; the dashed line is the age of beginning daily smoking. (*From* US Department of Health and Human Services, SAMHSA, Office of Applied Studies. National household survey of drug abuse: advance report #18. Washington DC: Department of Health and Human Services; 1991).

quit frequently realize dramatic gains in quality and length of life, with concomitant satisfaction for the physician.

Scope of the problem

The prevalence of smokers among the adult population of the United States reached a peak of 42.5% in 1965 and has gradually declined since then, sta-

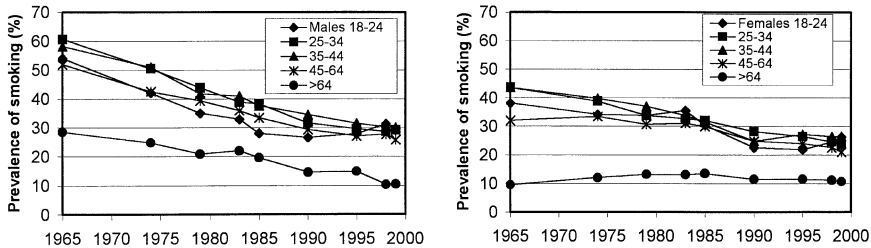

Fig. 2. Prevalence of smoking among various age groups from 1965–1999. The left panel shows data for males, the right for females. The prevalence of smoking is lower among older than younger Americans. Older females are the only group that does not show a substantial decline over the last 35 years. (*Data from* Eberhardt MS, Ingram DD, Makuc DM. Urban and rural health chartbook. Center for Health Statistics; Hyattsville, (MD): 2001 and Kumra V, Markoff BA. Who's smoking now? The epidemiology of tobacco use in the United States and Abroad. Clin Chest Med 2000;21:1–9).

bilizing at about 25% throughout the 1990s [5]. The prevalence of smoking among men was about 50% higher than among women during the 1960s, but the gender difference has narrowed, with smoking rates of 27% in men and 23% in women by 1995. The prevalence of smoking among older adults (those over age 64) is much lower than among younger adults (10% to 11% versus nearly 25% for those in the 45 to 64 age group), presumably because older smokers are more likely than younger smokers to have economic or health motivations to quit, and because death forcibly removes disproportionately more smokers than nonsmokers from the population. The generation of Americans who are now entering the geriatric population had lower smoking initiation rates than previous generations [6], so it is likely that future surveys of the older than 65 age group will show further declines in smoking prevalence. Nonetheless, there are some 3 to 4 million smokers among the geriatric population of the United States, and that figure is likely to hold steady as the population ages because reductions in prevalence will be balanced by increasing numbers of aged Americans.

The health costs of smoking in the United States are thought to total well over $100 billion, with additional social costs that are harder to estimate [7]. Of more relevance to the smoker are the substantial individual costs of cigarettes themselves (>$1500/year for a one-pack/day smoker in New York), the associated lost wages, the costs of smoking-related illnesses, and the less tangible but no less real costs of lost opportunities (smokers are considered less desirable employees, renters, and marriage partners) [7]. Some smoking-associated diseases are listed in the text box below.

Medical consequences of smoking

The text box below cites a vast array of health problems resulting from cigarette smoking. Smoking is by far the principal avoidable cause of illness in American society, causing more than 400,000 deaths per year in the United States [8]. Smoking is implicated in at least 84% of lung cancers and the vast majority of cases of chronic obstructive pulmonary disease, but it also plays major roles in many nonpulmonary cancers (head and neck, gastrointestinal, genitourinary, and even lymphatic), in coronary artery and cerebrovascular disease, in osteoporosis, in a variety of nonmalignant oral diseases [9], laryngeal diseases [9], and nonobstructive lung diseases (eg, pulmonary fibrosis, pulmonary hypertension, and pulmonary thromboembolism) [10], in burns, and even in cosmetic conditions such as wrinkling of the skin. Approximately 50% of long-time smokers die of smoking-related diseases. Comparing older smokers and nonsmokers, all-cause mortality is 2× greater for smokers than for those who never smoked [11,12].

Lung cancer

Lung cancer is a geriatric disease; one half of all lung cancers occur among people older than age 65 [13]. Nearly all lung cancers result from cigarette smoking. At least 96% of men and 85% of women who have lung cancer are or

Smoking-associated diseases

Cancers:	Lung
	Gastric
	Head and Neck
	Genitourinary
	Lymphatic
Vascular Diseases:	Stroke
	Coronary Artery Disease
	Peripheral vascular disease
Pulmonary Diseases:	Chronic Obstructive Pulmonary Disease
	Asthma
	Pulmonary Fibrosis
	Pulmonary thromboembolism
	Pulmonary hypertension
Gastrointestinal Diseases:	Peptic Ulcer Disease
	Gastroesophageal reflux
Trauma:	Burns
	Automobile accidents
Other:	Periodontal disease
	Reinke's edema of larynx
	Osteoporosis
	Impaired wound healing
	Skin wrinkling

were smokers [13,14]. Cigarette smoking increases the risk of developing lung cancer 10 to 20 fold in a dose-dependent manner [15,16]. Among older smokers there is a 70% chance that a solitary roentgenographic nodule will prove to be lung cancer. The extent of the risk is not permanent. Smokers who quit smoking for at least 10 years dramatically reduce their risk of lung cancer nearly to that of the general nonsmoking population [17–20], and this decline in the risk of lung cancer occurs similarly among smokers under and older than age 65.

Stroke

After hypertension, cigarette smoking is the most important risk factor for stroke, and some have estimated that as many as 60,000 strokes per year could be prevented in the United States by smoking cessation [21]. Five years after quitting smoking, a former smoker's risk of stroke approaches that of a non-smoker [21,22].

Coronary artery disease

Cigarette smoking is a major risk factor for coronary artery disease, with a two to four fold increased risk of occurrence [23], a greater than 70% excess rate of death among victims of myocardial infarction [18], and an increased risk of

sudden death [24]. The risk increases with the number of cigarettes smoked daily [25,26]. Cigarette smoking interacts synergistically with other important risk factors for cardiovascular disease such as hypertension, diabetes, and hypercholesterolemia [27]. After only 1 year of smoking cessation, the risk of dying from coronary artery disease declines 50%, however, and after 10 years the risk does not differ from that of nonsmokers [23].

Peripheral vascular disease

Cigarette smoking increases the risk of peripheral vascular disease [28–31], and smoking is the specific cause, in susceptible individuals, of thromboangiitis obliterans (Buerger's Disease), a particularly severe peripheral vascular condition [32]. As many as 20% of men and women smokers over age 65 have peripheral vascular disease [33]. If they continue to smoke, such individuals reduce the time to the development of gangrene and to limb amputation [34]. Smoking cessation is the most important intervention to slow the atherosclerotic process, reduce pain and disability, prevent limb amputation, and reduce mortality [35].

Chronic obstructive pulmonary disease

Cigarette smoking is by far the predominant cause of chronic obstructive pulmonary disease (COPD, chronic bronchitis, or emphysema), which affects over 3 million older Americans. As with cardio- and cerebrovascular diseases, the incidence of COPD and its mortality rate increases with the number of cigarettes smoked and the duration of smoking [36]. Lung function, measured most usefully as forced expiratory volume in 1 second (FEV_1), declines with age, even among nonsmokers, but there is usually enough reserve so that exercise tolerance for

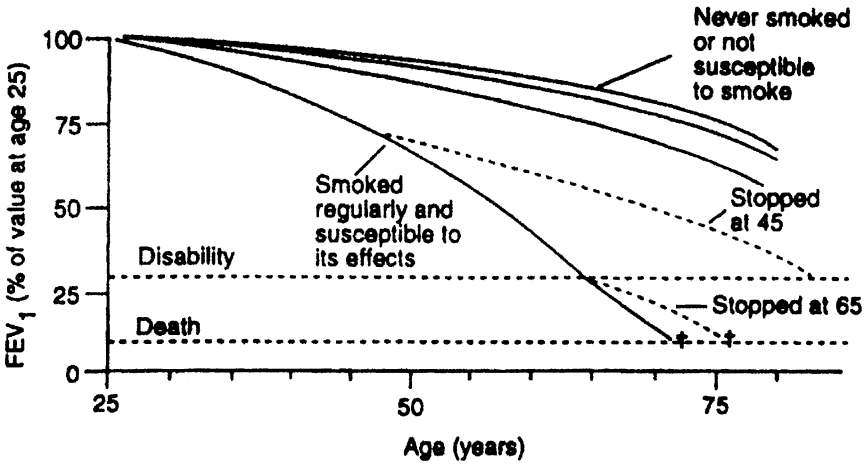

Fig. 3. Decline in lung function during aging. Normally, FEV_1 decreases over time, but not severely enough to cause disability or death. For smokers, FEV_1 typically declines more sharply, and continues to decline, at a slower rate, even after smoking cessation. (*Data from* Fletcher C, Peto R. The natural history of chronic airflow obstruction. Br Med J 1977;1:1645–8).

nonsmokers' activities of daily living is not substantially impaired (Fig. 3) [36,37]. This reserve is squandered by smokers, however, because FEV_1 declines more rapidly, often sufficiently to cross the symptom threshold, causing dyspnea on exertion or even at rest [38]. Even after smoking cessation FEV_1 might continue to decline, albeit at a slower rate, so patients who wait for the onset of dyspnea on exertion to quit might find that symptom relief does not occur. Quitting smoking—preferably well before the occurrence of exertional dyspnea—is an indispensable element of the treatment of any patient who has an airways disease.

Fires and burns

Fires and burns are the fourth leading cause of accidental death among people age 65 or older in the United States [39]. How many of these deaths resulted from cigarette smoking is unknown, but it has been established that the risk of a fire-related injury to the smoker or a family member is 5× higher in families in which one or more members smoke than among nonsmoking households [40]. Thus, there is no doubt that smoking contributes to the risk of death by fire not only for the smoker but also for nonsmoking family and neighbors, and that smoking cessation would reduce the risk.

Other

Cigarette smoking impairs wound healing and promotes vascular occlusion after vascular, breast, and reconstructive surgery [41–43]. Furthermore, even without postoperative wound complications, smokers have longer postoperative stays in intensive care units [44,45]. Nicotine, carbon monoxide, hydrogen cyanide, and aromatic hydrocarbons promote endothelial and epithelial breaks [46,47], increase platelet aggregation [48–50], reduce fibroblast proliferation [51], produce cutaneous vasoconstriction [52], and reduce tissue oxygen delivery [50,51] and oxygen transport [41,51,52]. Repeated passive exposure to environmental cigarette smoke appears to have similar effects [49,52–56]. Smoking cessation rapidly restores normal carbon monoxide levels, and within 6 months reduces platelet aggregation.

Finally, older adults serve as role models for children. Children living with parents or grandparents who smoke are more likely to become smokers themselves. Thus, by smoking, older people might be contributing to health problems of future generations.

Smoking cessation has the potential to reduce the risk of developing new disease, to slow or halt the progression of disease (Fig. 4) [17], and to improve quality of life [57].

Obstacles to smoking cessation

If people were entirely rational and wise, review of the data cited above would be sufficient to move almost all smokers to quit. Furthermore, while some of the

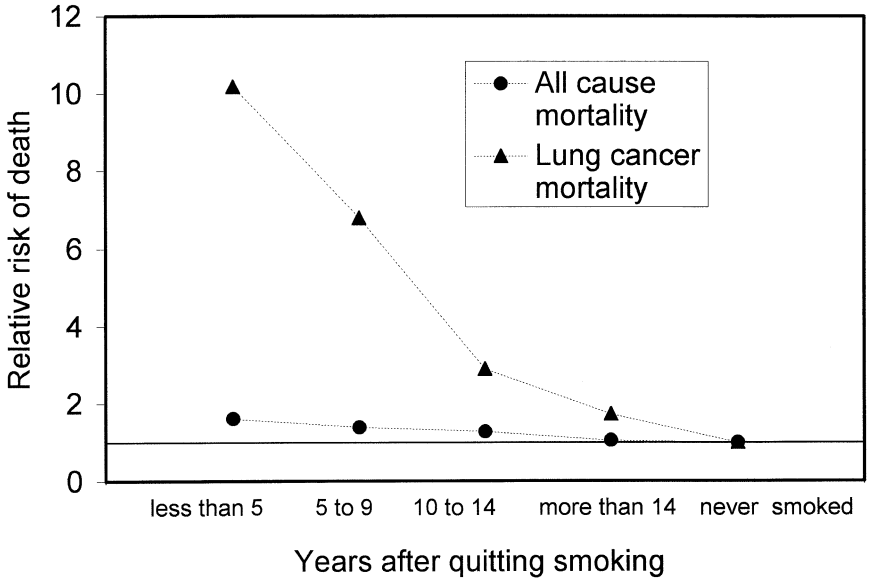

Fig. 4. The influence of smoking cessation on risk of death from all causes and from lung cancer, as functions of the number of years of abstinence. All-cause mortality declines dramatically with smoking cessation, but, although it too declines, mortality from lung cancer remains higher for smokers even 15 years and longer since cessation. (*Data from* Enstrom JE. Smoking cessation and mortality trends among two United States populations. J Clin Epidemiol 1999;52:813–25).

detail about the specific dangers and the magnitude of the dangers of smoking might be new and even surprising to some patients, it has been clear for many years to any literate and open-minded person that smoking is exceptionally dangerous, and few people really think that smoking is harmless. Nonetheless, many smokers do not accept the evidence, either because of denial or because of reflex suspicion of government and other authority recommendations, abetted by tobacco companies' adept use of the media and other public relations opportunities [58,59]. The problem goes well beyond a lack of scientific information or a failure to accept the information. Obstacles to responsible reaction to the well-known risks of smoking include misinformation, erroneous belief systems, habituation, the need to relieve stress, physical pleasure, and nicotine addiction. While one can tease these factors apart for discussion, in truth they are intertwined and interact to create and perpetuate smoking behavior.

Misinformation and erroneous belief systems

Although smokers generally acknowledge that smoking can be harmful, they underestimate the severity of the risk, and they believe that they are somehow immune to the dangers of smoking [60]. Even after correction for level of education, smokers over age 64 are significantly less likely than are younger smokers to recognize their own personal increased risk of cancer and cardiovascular

disease [61], possibly because individuals more inclined to recognize risk have already quit, leaving predominantly "hard-core" smokers. Older smokers often deny or fail to recognize that they are already experiencing symptoms from complications of cigarette smoking, and they seldom foresee accurately the obvious consequences to their own quality and length of life that they will have to endure while living with a smoking-related disease. Furthermore, older smokers—and often their physicians—can be fatalistic about smoking-related diseases, believing the "the damage has already been done." Consequently, older smokers often deny or fail to see the benefits that they might achieve from quitting.

When smokers do recognize the advantages of quitting, older smokers often express a preference for self-help modalities over formal programs. These smokers tend to be less confident in their ability to quit, leading to fatalism and impaired motivation to quit. Perhaps to some extent their preference for self-help modalities reflects this lack of confidence and represents an unstated desire to fail in private. Physicians might share similar pessimism: "They have smoked so long they will never quit." Thus, older patients are often not advised to quit, or the advice is communicated along with the expectation that the attempt will be unsuccessful—a self-fulfilling prophecy.

Habituation

For long-time smokers, smoking is a part of daily life, many times per day. Some long-time smokers cannot remember a time when they did not smoke, and most think of smoking as an integral part of many daily activities and tasks. Most long-time smokers smoke as soon as they awaken in the morning, usually before dressing or even getting out of bed. Some even awaken during the middle of the night to smoke. Most smokers smoke after every meal, when they are talking on the telephone, while watching television, and while driving. For many, especially those who drink in bars, smoking is part of their daily social life, and it is sometimes their only contact with other people. A physician seeing a patient who has smoked one pack of cigarettes each day for 40 years is seeing someone who has already taken well over 5 million puffs. There are few other voluntary actions a smoker has done as frequently.

Smokers route their way to and from planned activities along paths designed to allow purchase of cigarettes or, especially as smoke-free regions expand, to allow consumption of cigarettes. They usually know exactly how many cigarettes they have and exactly where they are located. Keys, clothing, and papers may be misplaced, but cigarettes are not. Smokers might forget to carry or indeed run out of metered dose inhalers (MDIs) or other symptom-relieving medications, but they seldom forget their cigarettes, and they almost never run out of them.

Stress

Many smokers believe that smoking helps them to handle stress, so they smoke before involving themselves in and to calm themselves during and after

stressful situations. The belief that smoking alleviates stress has been fostered by the media [62] to the point that it has become almost a truism. The accepted calming influence of smoking is often the excuse for returning to the habit or for foregoing any attempt to quit.

Pleasure

Smokers often report that the first few cigarettes they smoked in their youth were not at all pleasant—usually they coughed or were nauseated. These individuals smoked to be a part of a group, because of social pressures, as an act of defiance, or because it was grown-up, cool, or exciting. If cigarette smoking were always only physically repulsive, few would continue to smoke. In a dose-dependent manner, nicotine and perhaps other chemical agents from smoked cigarettes stimulate the central nervous system to raise plasma levels of norepinephrine, epinephrine, dopamine, arginine–vasopressin, β endorphins [63–65], CSF levels of β endorphins, adrenocorticotrophic hormone, cortisol, and acetyl choline [63,65,66]. These changes have behavioral manifestations including pleasure enhancement (from dopamine, norepinephrine, and β endorphins), enhanced ability to concentrate (from norepinephrine–locus coeruleus interaction), briefly enhanced memory consolidation and retrieval (from arginine vasopressin, acetyl choline, and norepinephrine), reduction in tension and anxiety (from β endorphins), attention modulation and reduced sensitivity of nicotine receptors (from cortisol), and relief from nicotine withdrawal (from acetyl choline) [67]. One consequence is the undeniable pleasure that smokers obtain from the habit, a benefit without which smoking would not persist and which the smoker must become willing to forego when he or she quits. Nonetheless, most long-time smokers concur that of the many cigarettes they smoke each day, little pleasure is derived from most of them.

Physical addiction to nicotine

Most smokers gradually increase the number of cigarettes they smoke each day then level off to a number from which they seldom deviate. Their typical daily routine is to smoke a few cigarettes at the start of the day (increasing alertness and correcting nicotine withdrawal) then to smoke at intervals short enough to maintain their nicotine levels within a narrow range [68,69]. While nicotine levels vary among smokers, each smoker tends to maintain rather constant nicotine levels from day to day [70], avoiding the unpleasant side effects of excessive nicotine levels (headache, tremor, nervousness, nausea) and of withdrawal (irritability, restlessness, anxiety, impaired concentration, increased appetite, and craving for tobacco).

Smokers become so adept at maintaining their nicotine levels within their customary peak–trough range that they can adjust their nicotine intake by varying the drag frequency, drag volume, breath holding time, and how far down the cigarette they smoke. In one experiment, progressively lowering the

nicotine content of cigarettes did not alter the plasma nicotine levels significantly until ultra-low nicotine cigarettes were employed [71]. This phenomenon should be borne in mind when assessing patients who claim to have "cut down" their smoking but have not quit or when considering strategies for quitting that reduce the number of cigarettes before quitting entirely. In both cases, although money can be saved that would otherwise be spent on cigarettes, it is unlikely that any measurable risk reduction has taken place or that the eventual nicotine withdrawal that occurs with abstinence will be any easier.

The rate of delivery of nicotine can also have important consequences. West et al noted that reintroduction of nicotine was less successful at relieving withdrawal-induced craving for cigarettes when nicotine plateau levels were reached slowly (by intravenous infusion) than when they were achieved rapidly (by smoking) [71]. They also noted less intense withdrawal symptoms when ultra-low nicotine cigarettes were used to produce low plasma levels of nicotine than when nicotine gum was used to produce similar levels. They suggest that the rate of nicotine absorption might affect withdrawal symptoms as much as does the nicotine level. An alternate explanation, which they also acknowledge, might be the subtle, unconscious expectation of symptom relief that comes from smoking and does not come from intravenous infusion or gum chewing.

While withdrawal symptoms tend to be most intense shortly after quitting, some symptoms can last several weeks, and some persist longer than others. Stitzer and Gross showed that anxiety and tension resulting from smoking cessation persisted for 4 to 5 weeks, while hunger, increased eating behavior, and craving for cigarettes persisted for at least 10 weeks [72]. While meta-analysis of nicotine replacement studies suggest that nicotine replacement can generally be withdrawn after 6 weeks of treatment without sacrificing efficacy [73], the data of Stitzer and Gross suggest that longer treatment might be more effective, at least in some individuals.

While withdrawal symptoms contribute significantly to smoking behavior, one must remember that the neuroregulatory effects of nicotine interact dynamically with many ongoing social and environmental cues to create the behaviors. Most studies have shown that combining treatment of withdrawal symptoms with behavioral modification is more successful than either one alone.

Approach to smoking cessation

In 1996 the Agency for Health Care Policy Research, now called the Agency for Healthcare Research and Quality (AHRQ), reviewed the state-of-the-art of smoking cessation approaches, identifying strategies and rating the evidence on which they were based. Based on that review, they published a guideline outlining a number of specific recommendations for clinicians and provider organizations that reflect strategies that had well-documented success in promot-

ing smoking cessation [74]. The Guideline was updated in 2000 [75]. Six key recommendations come from the AHRQ's report, all of which are relevant to geriatric practice and patients [5,76,77].

Smoking status as a vital sign

As a part of every contact of a patient with a health care provider, smoking status (current, former, or never) should be documented by prominent notations in the chart, just as vital signs are.

Intervention for all smokers

Because smoking is uncommonly dangerous and effective therapy to promote cessation is available, *all* smokers who come to medical attention for any reason should be at least briefly counseled to quit, and motivated patients should be offered at least brief treatment.

Dose–response relationship

Person-to-person counseling and treatment (rather than lectures, pamphlets, or videotapes) are recommended, and more intensive treatment yields better results than brief treatment.

Optimal types of counseling

Optimal types of counseling include provision of practical problem-solving skills, intratreatment social support, and assistance with extratreatment social support. Specific recommendations for psychotherapy or behavior modification are not provided in the AHRQ reports.

Pharmacotherapy

The antidepressant bupropion and nicotine replacement therapy with gum, inhaler, nasal spray, or transdermal patch are considered first-line therapies that should be used as part of smoking cessation approaches for *all* smokers who are attempting to quit, unless there are specific contraindications. Clonidine and nortriptyline are considered effective second-line agents.

The authors' approach

Our approach to implementation (see Fig. 5) of the AHRQ recommendations and the necessary concomitant behavioral therapy is outlined below. What follows is a clinical approach for patients of all ages that we have found to be effective. It is offered as a guide and is by no means intended to be dogma.

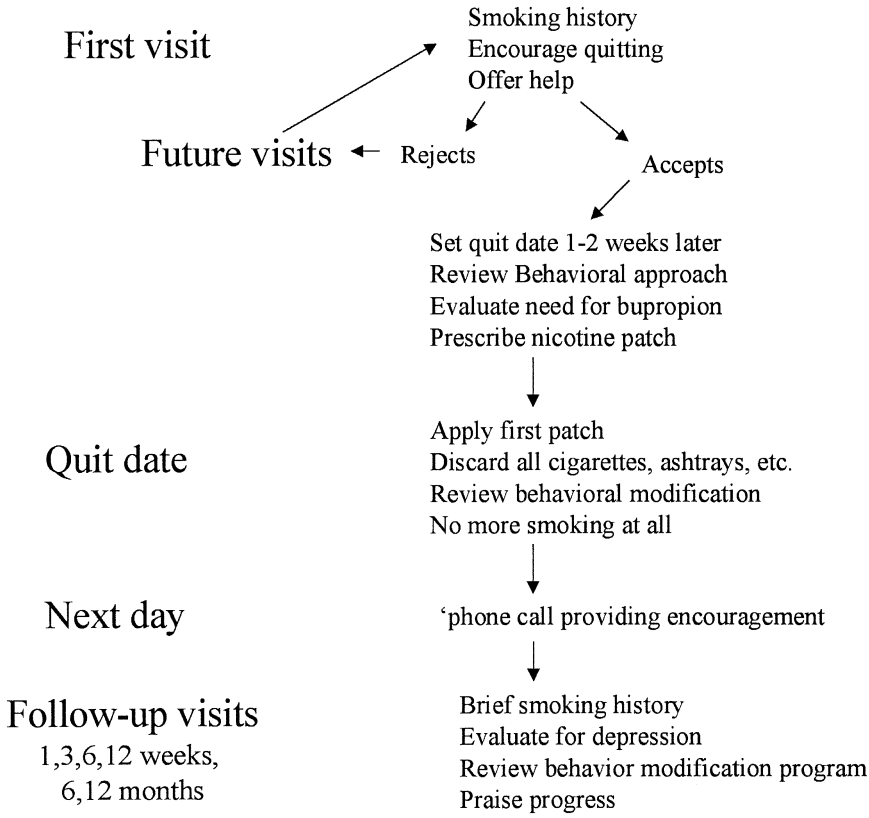

Fig. 5. Overview of our smoking cessation program.

Smoking history

Along with careful medical, social, and family histories and a physical examination, we collect a detailed smoking history:

What brand of cigarettes do you smoke?
When did you start smoking? How many cigarettes per day?
Do you inhale?
Where do you smoke?
Do you smoke alone or with others?
Do you smoke at work? In the home? Do your family members smoke? What hours do you sleep?
Do you awaken from sleep to smoke? If you awaken for other reasons, do you smoke? When is the first cigarette of the day?
Do you smoke more in the morning or later in the day?
Do you bum cigarettes?
Do you enjoy smoking? Do you enjoy all or only some cigarettes?

Do you smoke when you are sick?
How long can you go without cigarettes before developing craving?
Have you ever thought about quitting smoking?
If no, what do you see as difficult about quitting?
Have you ever quit before? How did you do it?
What led to your decision to go back to smoking?
How much coffee, chocolate, and alcohol do you consume?
Have you ever been depressed?

Although we probably ask for more than is really needed, an extensive history demonstrates a serious concern about smoking, and the recognition that the smoker's problem is complex, multifaceted, and with biological features that the authos assess objectively, just as for any other medical problem. This history also identifies smokers who are likely to be addicted to nicotine—those who smoke more than three-fourths of a pack per day of medium to high nicotine level cigarettes, who identify themselves as "inhaling," who smoke within 30 minutes of awakening, or who smoke when they are ill [78]. Such patients are highly likely to be addicted and to benefit from pharmacologic treatment of withdrawal symptoms as part of the cessation program.

After the history and physical examination have been completed, if there is already evidence of smoking-related illness, it is discussed. This often leads naturally into a patient-initiated discussion of the cause of the condition and the patient's verbalization of the need to quit. In such cases, the patient has already demonstrated motivation, so instead of authoritatively insisting that the patient must quit, the physician can express the desire to help, avoiding infantilizing the patient.

If the patient does not bring up the possibility of quitting, the physician can provide the necessary prompts: "Are you familiar with the lung condition called emphysema and its relationship to smoking?" Most will acknowledge that smoking might be contributing to their symptoms and that they should try to quit. It is an unusually stubborn patient who, faced with a serious smoking-related condition, does not acknowledge that quitting would be appropriate. Allowing that decision to come from the patient instead of the doctor fosters an adult physician/patient relationship that optimizes the chances for long-term success in smoking cessation.

If no serious smoking-related illnesses have been uncovered, the physician can still, in the context of risk reduction, initiate a discussion of the relationship of smoking to coronary artery disease and can inquire, "Have you ever thought about quitting?"

For the few patients who do not express any desire to quit, smoking cessation programs are unlikely to be successful. Nonetheless, we believe that it is important to be sure that the patient is fully informed of the likely consequences of a choice not to attempt to quit. The physician empathetically communicates concern over the patient's smoking, and smoking-related illness is specifically discussed in the context of the patient's social and family

milieu—specifically what it will mean to the patient to have and live with a stroke, to be dependent on supplemental oxygen, or to become dependent on specific (usually younger) family members. People often fantasize that they will be able to use all of their current strength and resources to solve future health problems. In reality, chronic heart, lung, cerebrovascular, or peripheral vascular disease due to smoking commonly severely impairs patients' ability to care for themselves.

We believe that it is important to remind the patient that no one is forced to smoke, that one does so by one's own choice, and that such a choice is likely to bring on serious unnecessary problems for the patient and the patient's family. While smoking-related illnesses are frightening, the goal is not to scare the patient, but to open the patient's eyes to more fully recognize what they are choosing for themselves and their family when they smoke. The tone must be sympathetic, not threatening or haughty.

Even patients highly resistant to the antismoking message often change their attitudes, and, on subsequent visits, express a desire to quit.

Setting the quit date

While the quit date is mutually agreed upon by patient and physician, it is generally advisable for it to be at least 1 week, but no more than 2 weeks, after the decision to quit. The patient will need 1 week to adjust psychologically to the prospects of quitting smoking and to get the elements of the quit program in place, but does not need more than 2 weeks to develop "cold feet." At the same time, if there are important stresses or losses in the patient's life, these might need consideration in setting an appropriate date.

During the interval between the initial visit and the quit date, the patient is instructed to carry out a set of tasks in preparation for the quit date. These include:

(a) Re-position your bed so that when sleeping, your head will be where your feet used to be. This forces the patient to begin the day with a new routine.
(b) Remove all cigarettes, matches, lighters, and ashtrays from the home, car, and workplace. Make it clear to the patient that you know that he or she knows where all of the cigarettes are. Explain that cigarettes must not be left about the house to tempt the patient or to make it easier to smoke.
(c) Inform others in the house who may smoke that, "My doctor has told me that I must quit smoking now and that I cannot even be exposed to smoke. I am not telling you to quit smoking—that is for you to decide—but if you smoke, you must go out of the house to do so. Please help me keep cigarettes out of my sight, smell, and mind."
(d) Slice carrots or celery into sticks and place in glasses with water to keep them crisp. Place them next to telephones and where the patient sits to read or watch television. Before answering or making a telephone call, tilt your head back, take a deep sigh, and pick up a carrot or celery stick and hold it in your hand or mouth until the telephone conversation is complete.

(e) Drink five tall glasses of a non-caloric, non-caffeinated beverage regularly each day and also if there is an urge to smoke that does not quickly pass.
(f) Set an ending time for each meal before sitting down to eat. An activity, preferably one that includes exercise, is planned for the set meal ending time. When the meal ending time arrives, the patient leaves the table to carry out the planned activity, regardless of how much food is left on the table. Our experience supports observations that significant weight gain during smoking cessation efforts can be a major factor contributing to relapse, particularly for women. Furthermore, it is counterproductive for a patient to quit smoking only to gain substantial weight and develop diabetes or sleep apnea. The emphasis is on weight control, not weight loss. Most smokers enjoy a cigarette at the end of their meal. This cigarette terminates the meal, signaling its end. Quitting smoking removes this signal, so many smokers report sitting at the table for long periods after their meals, eating!
(g) Bars and parties where smoking is likely to be prevalent are best avoided.
(h) Patients are cautioned to limit caffeine and alcohol intake. The rate of caffeine elimination decreases dramatically with smoking cessation [79]. Thus, although randomized trials have not suggested that caffeine abstinence enhances quit rates [80], patients who do not reduce caffeine intake might find themselves with symptoms of caffeine excess. To a lesser extent, ethanol elimination is enhanced by smoking [81] and would be expected to decrease with smoking cessation, potentially leading to reduced ''tolerance'' for alcohol.
(i) Cigarettes must not be ''bummed.'' Should the patient feel that he or she must have a cigarette, that is his or her choice, but the choice should be carried out in the context of still trying to quit smoking (which is also his or her choice). The patient is told that he or she must go out and purchase a full pack of 20 cigarettes. Before having one, he or she is asked to acknowledge the ongoing quit-smoking effort and the temporary inability to refrain from smoking at that moment. To reaffirm the quit smoking effort and to avoid hoarding unneeded cigarettes, nineteen cigarettes are discarded before lighting up the one ''needed'' cigarette. Of course, the ''needed'' cigarette could also be discarded at that point. This feature of the behavior modification program is contractual.

The above are not intended to be rigid rules; they can and should be modified to meet individual circumstances. Smokers who never smoke while talking on the telephone certainly have no need for the carrot and celery sticks during telephone conversations. Nonetheless, the authors believe that the goals of the program are useful: to begin the day physically differently than before, in an environment free of cigarettes; to find noncaloric means to assuage the needs of empty hands; to control weight; to avoid stimuli that enhance smoking; and to reinforce the desire to quit by performing an act of quitting (throwing out unneeded cigarettes even before a slip). Furthermore, the outlined program consists of relatively simple

tasks at which patients can succeed while working to attain the much more difficult task of quitting smoking. Patients should sense that they are participating in developing the rules. Finally, it should be made clear that what is being sought is an existential change from smoker to nonsmoker. Nonsmokers have no need for cigarettes, cigarette lighters, or ashtrays.

For most patients, nicotine addiction is a significant factor, and nicotine replacement is used, usually with nicotine patches. For smokers who smoke three-fourths of a pack or more per day, 21 mg patches are advised. Gums, particularly for older patients who often have dentures, are hard to chew and produce lower plasma nicotine levels than patches. Inhalant devices can be irritating to mucosal surfaces and tend to reinforce cigarette inhaling behavior. We prescribe the nicotine replacement in advance of the quit day and ask the patient to bring the first patch to the office to start on the quit day.

Patients are often concerned about potential side effects of nicotine, but, as we often point out to patients, as smokers they are already taking nicotine—the therapy is replacement, not a new drug. An additional problem is that most insurance plans do not pay for nicotine. We often point out to patients that the cost is not much different than they are already paying for cigarettes.

Patients are told to regulate smoking as they choose until the quit day, but on that day, they will leave the office as non-smokers.

For patients who have histories of serious depression, psychiatric consultation prior to embarking on a quit smoking effort might be in order. There is substantial risk of reactivation of major depression among smokers during smoking cessation [79], so for such patients smoking cessation might not be advisable except under careful psychiatric monitoring. In milder cases, treatment with bupropion can handle the depression and assist in management of the nicotine withdrawal. Further, bupropion does not promote weight gain or impair sleep. It is contraindicated in patients who have histories of seizures, however. Should bupropion be used, it is wise to start this medication at least 2 weeks before the quit date. Nicotine replacement is often needed along with bupropion.

The quit day

Patients come to the office on the quit date with patches. The entire behavioral modification scheme is reviewed and all parts of it checked to assure its complete application. Patients are shown how to apply the patches; after the skin is cleansed with alcohol and dried, patients apply the first patch. While patients could apply the patches themselves at home, we prefer that everything begin on the agreed-upon quit day, with patient and physician beginning the process together, to cement the concept that the patient is not going through the process alone. Patients are instructed to rotate the site of application of patches among arms and chest such that the same site is not used more than every 3 to 4 days to minimize the development of rash, the most common side effect.

Throughout this entire process—indeed, throughout the entire smoking cessation effort—patients are praised for making the choice to stop smoking. They are

told that just as they smoked by choice, they will quit by their own choosing. Patients are given credit for the undertaking. The physician avoids and corrects jargon and thoughts that imply that the physician is "getting the patient to quit smoking." Patients are told that the effort might be more difficult or might be easier than anticipated, but that the physician has great confidence that they will be successful. Patients are asked how they feel and what specific problems they foresee. They are advised not to consider quitting "forever." Instead, the goal is to get to the next day without a cigarette then to change to a new patch and take it one day at a time. The patients are strongly advised to quit smoking completely (no tapering). As noted above, tapering the number of cigarettes does not necessarily reduce nicotine levels (or other toxins) significantly. More importantly, patients are being asked to make an existential change, becoming nonsmokers rather than smokers. In that sense, smoking one cigarette does not differ from smoking a pack.

The day after the quit day, patients are telephoned and asked how they are doing. The physician communicates that the reasons for the call is not to "check up" on the patients, but to acknowledge how tough it might be and to help solve any practical problems. At the end of this brief phone call, the patient is asked where the carrot or celery stick is.

Follow-up visits

The patient returns 1 week after the quit date then at intervals that seem appropriate to the patient's needs. We usually see patients at 1, 3, 6, and 12 weeks, and then at 6 and 12 months. Planning follow-up visits from the start of the smoking cessation process serves to assure patients that they will not be abandoned, even if they do not quit right away, and that the goal is a long-term behavior change, the outcome of which cannot be predicted by what happens in the early weeks.

Patients are questioned regarding their efforts to keep from smoking, exposure to second-hand smoke, sense of well-being, physical symptoms, and side effects from medications. Patients who have histories of depression are questioned carefully and directly regarding their mood and sleeping pattern. Objective measures, such as an improving peak flow rate, declining expiratory breath carbon monoxide level, cleared chest on auscultation, improved sense of smell, and improved exercise tolerance, might help reinforce the effort. Credit for success always goes to the patients. Lack of success is not termed a failure; rather, patients are reminded that quitting smoking often does not succeed on the first effort and that it is important to keep trying. Perhaps more importantly, patients are encouraged to understand that they are succeeding by trying to quit.

Some smokers might experience increased cough during the first or second week after quitting smoking. This probably reflects repair of the mucociliary escalator mechanism of the bronchial mucosa. Smokers who experience increased cough can be encouraged that this cough will be short-lived and that it is a sign that their body is undergoing self-repair.

Patients who quit smoking for 1 or 2 weeks might feel overconfident and try to quit medication prematurely. We advise against stopping anti-withdrawal medication sooner than 6 weeks; in fact, as noted above, 10 weeks may be preferable for many patients. Regular follow-up is advised after treatment with medications has been discontinued.

The above is a description of a rather intense approach to smoking cessation that incorporates recording of smoking as a vital sign, advice to quit, pharmacologic treatment of withdrawal, and behavioral modification. This approach has worked well for the authors' patients of mixed age with objectively confirmed 1-year quit rates of 23% in one study and 32% in another (continuation of the 10-week study reported in [82] and unpublished observations), which compare favorably to published results of others using nicotine replacement and behavioral modification [73]. Others have used somewhat different approaches with good results. Rimer, for example, in response to older smokers who prefer to try a more independent approach, developed a self-help guide, "Clear Horizons" [83]. This guide presumably was more helpful than the National Cancer Institute's more general guide for smokers of any age, "Clearing the Air." Quit smoking rates at 1 year were 20% and 15%, respectively, for Clear Horizons and Clearing the Air (self-report; no objective confirmation). When the Clear Horizons guide was combined with the National Cancer Institute's "Ask, Advise, Assist, Arrange" protocol and use of nicotine gum when appropriate, quit smoking rates were 15% after 6 months and twice that of a competitive control group [83].

Nicotine replacement therapy

Many placebo-controlled, double-blind, objectively confirmed data support the use of nicotine replacement for smoking cessation [73,84,85] without (or, more favorably, with) behavioral modification. Although nicotine has many potential cardiac and other complications, its use in therapy is for replacement of nicotine that the patient is already receiving by another route (smoking). Thus, unless excessive doses have been prescribed or the patient smoked numerous daily cigarettes while still taking replacement therapy, side effects from nicotine excess are unlikely [86]. Placebo-controlled trials of transdermal nicotine in patients who have coronary artery disease (admittedly limited to patients aged < 70 years) have not demonstrated an increased risk of cardiac complications [87,88], even though substantial numbers of patients continued to smoke while taking transdermal nicotine.

The pharmacodynamics of nicotine are not substantially different in the healthy elderly than in younger patients [89], but elimination is impaired in renal insufficiency [90]. Thus, dosage adjustment might be prudent in patients who have impaired renal function. Nonetheless, because transdermal nicotine dosing is based on the number of cigarettes smoked per day, if the smoking history is judged to be reliable and the patient does not continue to smoke, transdermal nicotine at about 1 mg/day per cigarette smoked (to a maximum of 21 mg/day) should be less toxic than continuing nicotine (and other toxin) intake by continuing to smoke.

Bupropion

Bupropion sustained release, an aminoketone antidepressant, has also been demonstrated objectively to be effective [91] with or without nicotine replacement. The initial dosage is 150 mg/day for the first 3 days. Thereafter, 150 mg is given twice daily, and treatment is continued typically for 8 to 10 weeks. While quit rates are as good or higher than those produced by nicotine patch, drop-out due to adverse effects is higher. Seizure disorder is a contraindication to the use of bupropion.

Clonidine

Clonidine is considered to be an effective second-line choice of pharmacotherapy for smoking cessation. Since Glassman first reported that clonidine attenuates withdrawal-induced craving for cigarettes [92], conflicting reports have shown benefit or lack thereof [93], but meta-analysis has suggested that clonidine increases the chances for success by some 90% at the expense of high incidences of side effects such as sedation and dry mouth [94]. Clonidine has been shown to be effective when administered orally and when given in patch form [94]. We have found that clonidine is helpful in reducing the intensity of withdrawal craving for cigarettes and in promoting sustained smoking cessation, whether used alone or with nicotine replacement [82].

Because the transdermal preparation usually produces fewer adverse effects than the oral form, we prefer to use the patch. The most common adverse effect is rash. In our experience, once an intense rash develops, continued use of the patch—but not the oral preparation—often produces inflammation at many of the previously used patch sites. Other side effects include dry mouth, fatigue, gastroesophageal reflux, and hypotension.

The skin is cleansed with alcohol and allowed to dry before placing the patch on the skin, and the patch is changed to varying remote sites every 6 days. Minor local skin irritation can be treated with a mild topical steroid skin cream. Intense irritation, however, is a cue to discontinue the drug.

Other modalities

Other modalities such as hypnosis or acupuncture have advocates, particularly with the increasing popularity of alternative medicine treatments. While there is no doubt that there are anecdotal examples of success with these treatments, we know of no double-blind studies that objectively confirm better long-term quit rates with these treatments than with placebos [95,96].

Summary

Today, two generations after the first Surgeon General's report, and with abundant evidence of the catastrophic consequences of smoking, no serious person can be unaware that smokers risk their lives and health. We also know that quitting smoking—at any age—promises significant health benefits. When offered the

tools they need, older smokers quit smoking at rates comparable to those of younger smokers despite their skepticism, fatalism, and self-doubt.

Older smokers should be encouraged to enter programs that stress the health benefits derived and identify the risks they are avoiding by quitting smoking. These programs establish quit dates, use sound behavioral modification techniques, provide strategies for stress management and relaxation, treat withdrawal symptoms, and provide regular and continuing follow-up. The patient is asked to make an existential change, and the physician should provide encouragement and promote self-confidence by emphasizing that, despite setbacks, with repeated efforts, success can be achieved.

Clinicians can influence patients to quit smoking, and they should.

Acknowledgments

The authors gratefully acknowledge valuable conceptual and editorial advice from C. Knight Aldrich, MD, Professor Emeritus of Psychiatry, University of Virginia, Charlottesville, Virginia.

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