

Effective Tobacco Dependence Treatment

Michael C. Fiore, MD, MPH

Dorothy K. Hatsukami, PhD

Timothy B. Baker, PhD

MORE THAN AT ANY TIME IN the past, clinicians, public health professionals, and policy makers now possess sufficient evidence to implement effective tobacco dependence treatment programs and policies. We review key findings of great relevance to treating tobacco dependence: clinical, health system, and community interventions can each independently foster tobacco cessation.^{1,2} A transdisciplinary approach that incorporates all of these components holds the greatest promise for reducing population-based rates of tobacco use. If these interventions are implemented broadly, a larger proportion of the 46 million US adult smokers will try to quit. Among those who do try, the likelihood of successful cessation will increase substantially.

Epidemiology

In 1999, the proportion of US adults who had successfully quit (45.7 million [23.1%]) approached that of individuals who continued to smoke (46.5 million [23.5%]).³ This statistical equivalence highlights the progress achieved over the last half-century. It also reveals the challenges we face in the new century if more individuals are to successfully quit.

The fact that 50% of persons who have ever smoked have now quit is evidence that cessation can yield significant net decreases in smoking prevalence. To further decrease prevalence, increased rates of cessation are necessary. The US Public Health Service (PHS) publication *Tracking Healthy People 2010*⁴ set a national goal of reducing tobacco use to 12% or less among adults by the end of this decade. Two recent publications

provide a blueprint for achieving one aspect of that goal (increasing cessation rates nationally): the PHS Clinical Practice Guideline *Treating Tobacco Use and Dependence*,⁵ and the Centers for Disease Control and Prevention (CDC) *Guide to Community Preventive Services: Tobacco Use Prevention and Control*.^{6,7} Together, these documents outline specific, state-of-the-art clinician, health care system, and community interventions that can boost cessation success significantly.

Implementing the CDC and PHS guideline recommendations is important, because data suggest that there exists a group of smokers that may be more heavily dependent than in the past and that these individuals may have a more difficult time quitting.⁸ The epidemiology of tobacco use has continued its 50-year evolution from an equal opportunity addiction to a behavior that now affects primarily the most socioeconomically disadvantaged members of society. For example, in 1999, among those with masters, professional, or doctoral degrees, only 8.5% used tobacco. Conversely, 44.4% of those with only a high school General Educational Development degree used tobacco. Individuals living below the poverty level had a significantly higher smoking rate (33.1%) than did those living at or above the poverty level (24.4%).³ Recently, college students demonstrated an exception to the above epidemiological observation. A 1999 survey of nationally representative 4-year colleges found that 45.7% of students reported use of a tobacco product in the past year and 32.9% reported that they were current users, indicating a particular need for assessment and intervention in this population.⁹

Recent epidemiologic findings from California highlight the positive impact tobacco control programs that include cessation can have on public health.¹⁰

These findings show that implementation of the state's aggressive tobacco control efforts funded by the citizens' initiative, Proposition 99, were associated with marked declines in tobacco use rates.¹⁰ These data suggest that well-funded tobacco control initiatives lead to reductions in tobacco use and are likely to improve health and save lives.

These California findings challenge other states to allocate more tobacco settlement funds (nationally, more than \$10 billion per year) or other funding sources to pay for aggressive, evidence-based, comprehensive tobacco control initiatives.¹¹ Although the CDC has provided an outline of *Best Practices for Comprehensive Tobacco Control Programs*,¹² only 7 states (Arizona, Indiana, Maine, Massachusetts, Mississippi, Ohio, and Vermont) have met the CDC goal of allocating at least 20% of settlement dollars for tobacco control efforts.¹³ Evidence-based, population-wide, smoking cessation interventions have been ignored or underfunded. Although smokers addicted to tobacco are generating the tobacco settlement monies, only a small proportion of this money is being dedicated to improve the health and welfare of these tobacco users.

Author Affiliations: Department of Medicine (Dr Fiore) and Center for Tobacco Research and Intervention (Drs Fiore and Baker), University of Wisconsin Medical School, Madison; Department of Psychology, University of Wisconsin, Madison (Dr Baker); and Department of Psychiatry, University of Minnesota, Minneapolis (Dr Hatsukami).

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Corresponding Author and Reprints: Michael C. Fiore, MD, MPH, Center for Tobacco Research and Intervention, University of Wisconsin, 1930 Monroe St, Madison, WI 53711 (e-mail: mcf@ctri.medicine.wisc.edu).

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Economic Benefits

In addition to the known health benefits, there are also economic factors that support the widescale availability of tobacco cessation treatments. For example, after controlling for age, race, sex, and chronic conditions, current smokers utilized 18% higher health care charges over an 18-month period than persons who never smoked.¹⁴

New evidence also ties smoking to workplace absenteeism and productivity losses.¹⁵ Workplace productivity was noted to increase and absenteeism to decrease among former smokers compared with current smokers. These findings support previous data showing that nonsmokers are more productive, take fewer sick days per year, and use fewer health care resources than smokers.^{16,17} These data provide compelling evidence that both productivity and employee health are enhanced through successful worksite smoking cessation. Employers as health care insurance purchasers can have an important role in improving outcomes by ensuring that their insurance plans cover effective tobacco dependence treatments similar to coverage for the treatment of other chronic diseases such as hypertension, diabetes, or hyperlipidemia.

Clinical Approaches

The publication in 2000 of the PHS Clinical Practice Guideline *Treating Tobacco Use and Dependence* provides the most comprehensive review to date of the extant scientific data¹⁸ and provides a clinical roadmap to intervene effectively with tobacco users. Key recommendations include the provision of counseling, the consistent use of pharmacotherapy (in patients without contraindications), and the implementation of institutional changes. Guideline strategies were designed to change fundamentally the standard of health care to ensure that tobacco dependence is recognized and treated as a chronic disease. The guideline challenges clinicians and health care systems to identify and document the tobacco use

Table 1. The 5 A's for Brief Intervention to Treat Tobacco Dependence*

Ask about tobacco use	Identify and document tobacco use status for every patient at every visit
Advise to quit	In a clear, strong, and personalized manner, urge every tobacco user to quit
Assess willingness to make a cessation attempt	Is the tobacco user willing to make a cessation attempt at this time?
Assist in cessation attempt	For the patient willing to make a cessation attempt, use counseling and pharmacotherapy to help him or her quit
Arrange follow-up	Schedule follow-up contact, preferably within the first week after the cessation date

*Data from Fiore et al.⁵

status of every patient at every health care visit and to provide all tobacco users with at least a brief intervention based upon the 5 A's (TABLE 1).

When smokers try to quit on their own (ie, "cold turkey"), their long-term success rate is only about 5%. However, the interventions recommended in the guideline can boost long-term (>5 months) cessation rates to 15% to 25%.⁵ These higher rates compare favorably with those achieved by physicians providing brief interventions for other chronic diseases such as diabetes, hyperlipidemia, or hypertension. Brief interventions may be delivered at multiple points of patient contact: regular clinic visits, hospitalizations, and to patients' parents at pediatric visits.¹⁹ Given that 70% of smokers see a primary care physician each year, the population-wide impact of such brief clinical intervention could be enormous, resulting in millions of new ex-smokers each year.⁵

Recent findings can assist clinicians in promoting treatment of tobacco dependence among selected populations of users. First, clinicians can assure their patients that successful smoking cessation can lead to a marked improvement in current and future health,²⁰ and that the beneficial effects resulting from cessation occur even among older smokers.²¹ Second, evidence has now documented that smokers who switch to low tar or low nicotine cigarettes do not significantly decrease their health risks.²² Third, the 5 approved Food and Drug Administration medications for smoking cessation (sustained-release bupropion, nicotine patch, nicotine gum, nicotine inhaler, and nicotine nasal spray) have been shown to be safe

and should be recommended for all patients without contraindications trying to quit smoking.⁵ Using these treatments as part of a clinical intervention (TABLE 2) is particularly important given the extraordinary risk that results from continued smoking. Fourth, evidence shows that adolescent smokers can experience tobacco dependence including withdrawal symptoms with relatively low levels of tobacco use.^{23,24} It is appropriate to consider treating adolescent smokers with treatments identified as effective in adults.⁵ Finally, research shows that most smokers are at risk of relapse when they quit and that this risk may persist for several months. This vulnerability may be a result of a sustained experience of withdrawal symptoms, negative moods, or exposure to environmental cues associated with smoking.²⁵ These data underscore the importance of sustained treatment for tobacco use and follow-up interventions. For example, sustained-release bupropion has been shown to reduce relapse and blunt weight gain among individuals taking this medicine for 12 months.²⁶

Recent efforts have been directed toward investigating strategies to reduce tobacco toxin exposure. This type of an approach may be particularly important for tobacco users who are unwilling or unable to quit smoking. These strategies include modification of tobacco products (eg, reducing cancer-causing agents or other toxins in cigarettes), development of cigarette-like products (eg, less combustion than regular cigarettes to reduce pyrolysis products), and development or use of alternative nicotine products (eg, tobacco

lozenges). Studies have examined interventions to reduce the number of cigarettes smoked. The Institute of Medicine issued an article in the past year, which stated that while reducing risk of some diseases by reducing exposure to

tobacco toxicants is feasible, to date no strategy has been proven to reduce harm to health.²⁷

Table 2. Clinical Guidelines for Prescribing Pharmacotherapy for Smoking Cessation*

Who should receive pharmacotherapy for smoking cessation?	All smokers trying to quit, except in the presence of special circumstances. Special consideration should be given before using pharmacotherapy with selected populations: those with medical contraindications, those smoking less than 10 cigarettes/d, pregnant or breastfeeding women, and adolescent smokers.
What are the first-line pharmacotherapies recommended in this guideline?	All 5 of the FDA-approved pharmacotherapies for smoking cessation are recommended (sustained-release bupropion, nicotine gum, nicotine inhaler, nicotine nasal spray, and nicotine patch). Each of these 5 agents been demonstrated to be both safe and effective when used as directed.
What factors should a physician consider when choosing among the 5 first-line pharmacotherapies?	Because of the lack of sufficient data to rank-order these 5 medications, choice of a specific first-line pharmacotherapy must be guided by factors such as physician familiarity with the medications, contraindications for selected patients, patient preference, previous patient experience with a specific pharmacotherapy (positive or negative), and patient characteristics (eg, history of depression, concerns about weight gain).
Which pharmacotherapies should be considered with patients particularly concerned about weight gain?	Sustained-release bupropion and nicotine replacement therapies, in particular nicotine gum, have been shown to delay, but not prevent, weight gain.
Are there pharmacotherapies that should be specially considered in patients with a history of depression?	Sustained-release bupropion and nortriptyline appear to be effective with this population.
Should nicotine replacement therapies be avoided in patients with a history of cardiovascular disease?	No. The nicotine patch in particular is safe and has been shown not to cause adverse cardiovascular effects.
May tobacco dependence pharmacotherapies be used long term (eg, 6 months or more)?	Yes. This approach may be helpful with smokers who report persistent withdrawal symptoms during the course of pharmacotherapy or who desire long-term therapy.
May pharmacotherapies be combined?	Yes. There is evidence that combining the nicotine patch with either nicotine gum or nicotine nasal spray increases long-term abstinence rates over those produced by a single form of nicotine replacement therapy.

*FDA indicates Food and Drug Administration. Data from Fiore et al.⁵

Box. System-Level Interventions for Health Systems

Implement a tobacco user identification system in every clinic.
 Provide education, resources, and feedback to promote provider intervention.
 Dedicate staff to provide tobacco dependence treatment and assess the delivery of this treatment in staff performance evaluations.
 Promote hospital policies that support and provide inpatient tobacco dependence services.
 Include tobacco dependence treatments (both counseling and pharmacotherapy), identified as effective in the Public Health Service Clinical Practice Guideline,⁵ as paid or covered services for all subscribers or members of health insurance packages.
 Reimburse physicians and specialists for delivery of effective tobacco dependence treatments and include these interventions among the defined duties of physicians.

Health System Approaches

Over the last decade, research has demonstrated convincingly that institutional policies can either thwart or encourage tobacco intervention by clinicians. The PHS Clinical Practice Guideline summarizes key evidence-based health system interventions known to promote tobacco treatment activities (BOX).⁵

The impact of system-level interventions was demonstrated recently in a longitudinal analysis of the use and cost of 3 forms of coverage for smoking intervention services in a health care maintenance organization.²⁸ Full insurance coverage of tobacco dependence treatment services produced the highest level of service utilization but also the greatest declines in overall smoking prevalence. This translated into an extremely modest additional cost to the health care plan (\$0.22 to \$0.34 per enrollee per month).

Full insurance coverage for tobacco dependence treatment (counseling and medications) has also been shown to increase cessation attempts, cessation rates, and use of nicotine gum and patches compared with the lack of such coverage. These findings challenge insurers to comply with federal recommendations to include evidence-based tobacco dependence treatments (both counseling and pharmacotherapy) as paid or covered services for all subscribers or members of health insurance packages, reimburse physicians and specialists for delivery of tobacco dependence treatments, and include these interventions among the duties of physicians.

Purchasers of health care insurance, such as employers or corporations, have an important role. Specifically, they can institute system changes in the workplace, such as smoking bans, which have been shown to promote cessation, improve productivity, and protect nonsmokers from the dangers of environmental tobacco smoke.²⁹

Community-Level Interventions

In 2001, the CDC released its recommendations for evidence-based community strategies promoting smoking cessation.^{6,7} In particular, tobacco telephone quit lines, antitobacco mass media campaigns, and increasing the unit price of tobacco products were strongly recommended as community-level interventions that make a difference.

Telephone quit lines (personalized, proactive telephonic counseling to assist smokers in successfully quitting) are a highly effective way to provide smoking cessation treatment to large numbers of smokers.^{6,7} They have been successful in delivering effective cessation treatments to underserved populations (eg, low socioeconomic status and elderly individuals).³⁰ This evidence has particular relevance to states considering how to address smoking cessation as part of their comprehensive tobacco control programs.

Mass media campaigns are interventions of an extended duration that use brief, recurring messages to inform and to motivate tobacco users to quit.^{6,7} These campaigns have been shown to be effective in both increasing tobacco use cessation as well as reducing consumption of tobacco products. Their effectiveness is enhanced when they are combined with other community-level interventions (eg, excise tax increases).^{6,7}

Raising the unit price of tobacco products, by increasing state and federal excise taxes, is effective in promoting tobacco cessation and in reducing consumption.^{6,7} Considerable research demonstrates that population-wide rates of tobacco use are subject to the economic properties of price elasticity—the concept that price increases will produce corresponding drops in product purchases and use. Price-linked declines in tobacco use have been demonstrated repeatedly. For example, Massachusetts and Oregon imposed tobacco excise tax increases as part of a comprehensive tobacco control effort and, in both states, tax increases were followed by substantial declines in tobacco use rates, purchases, or both.^{12,31}

Conclusions

Numerous strategies now exist producing reliable and substantial increases in smoking cessation. The increased rates of cessation produced by these strategies have been linked to immediate and substantial decreases in morbidity and mortality. Effective tobacco dependence treatment strategies exist at several distinct levels of intervention: at the level of the clinician, at the level of the health care system, and at the societal or community level. A compelling conclusion generated from recent research is that further significant declines in tobacco use will require sustained tobacco dependence treatment interventions at all of these levels. While research suggests that a comprehensive approach to tobacco dependence is optimal, physician-delivered interventions are both effective and cost-effective. These findings underscore the responsibility of every physician to counsel every tobacco user about the risks of smoking, the benefits of cessation, and how to quit.

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