Kicking Butts in the Twenty-First Century:

*What Modern Science Has Learned about Smoking Cessation*

Prepared for
THE AMERICAN COUNCIL ON SCIENCE AND HEALTH

by Ashlee Dunston

*Assistant Director of Public Health, ACSH*

Art Director:
Yelena Ponirovskaya

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THE AMERICAN COUNCILON SCIENCE AND HEALTH (ACSH) APPRECIATES THE CONTRIBUTIONS OF THE REVIEWERS NAMED BELOW.

Michael Bracken, M.D.  
*Yale University School of Medicine*

Dimitrios Trichopoulos, M.D.  
*Harvard School of Public Health*

Sir Richard Doll, M.D., D.Sc., D.M.  
*University of Oxford*

Mark Willenbring, M.D.  
*Veteran Affairs Medical Center, Minneapolis, MN*

Michael C. Fiore, M.D., M.P.H.  
*University of Wisconsin*

Thomas P. Houston, M.D.  
*American Medical Association*

Richard Hoar, Ph.D.  
*Williamstown, MA*

Greg Connolly, D.M.D., M.P.H.  
*Massachusetts Department of Public Health*

George Lundberg, M.D.  
*Medscape General Medicine*

Pagona Lagiou, M.D.  
*University of Athens*

Mark Taylor, M.D.  
*Physicians for a Smoke-Free Canada*

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EXECUTIVE SUMMARY

Cigarette smoking is a very widespread and serious health problem. More than 46 million American adults smoke, and smoking contributes to more than 430,000 deaths in the U.S. each year.

Nearly 70% of smokers want to quit, and nearly 41% say that they have attempted to quit at least once in the past year.

Only about 4-5% of smokers who try to quit each year succeed in stopping smoking permanently. However, after repeated attempts, nearly 40 to 50% of smokers eventually succeed in quitting.

Counseling, drug therapy (nicotine replacement therapy or other forms of medication), or both methods in combination can substantially increase the likelihood of successful smoking cessation.

Five forms of nicotine replacement therapy — gum, inhaler, lozenge, nasal spray, and patch — have been approved by the U.S. Food and Drug Administration (FDA) for the treatment of nicotine dependence. The drug bupropion has also been approved for this purpose. Scientific evidence indicates that two other drugs — clonidine and nortriptyline — are also effective in helping some smokers quit. However, at present, these two drugs have not been approved by the FDA for this purpose, although they are approved for other uses. No other drugs have been shown to be effective as smoking cessation treatments.

Support groups, individual counseling, and telephone counseling have been shown to improve quit rates. The effectiveness of Internet pro-
grams to help smokers quit is currently being evaluated. Self-help materials and programs have not been documented as effective when used alone.

“Alternative” therapies for smoking cessation, including acupuncture, hypnosis, and herbal remedies, have not been proven effective. Some alternative therapies may be hazardous, and some herbal remedies may interact in detrimental ways with prescription or over the counter medications.

Smoking cessation treatment is not integrated into the general U.S. healthcare system at the present time and may not be covered by health insurance. Considering the substantial health costs of smoking, smoking cessation interventions should be strongly encouraged and fully integrated into the healthcare system.
“Quitting smoking is easy. I’ve done it a thousand times.”

—Mark Twain

If Mark Twain were alive today, he could have been more successful in his efforts to quit smoking — thanks to what modern science has learned about smoking cessation.

In Twain’s time — and for several decades after his death in 1910 — many people thought of smoking tobacco as merely a habit, and they believed that quitting was simply a matter of individual choice and willpower. Smoking was not then widely recognized as addictive, but we know now that it can be a strong addiction and that for many smokers willpower alone is not enough to give up tobacco permanently.

In recent years, researchers have learned a great deal about the factors that help people quit smoking successfully, the barriers that may interfere with smoking cessation, and the special problems faced by specific groups of prospective quitters — such as pregnant women, adolescents, and individuals with psychological and psychiatric problems. Scientists have also developed new techniques for smoking cessation — including both drugs and counseling methods — that substantially increase the chances of success.

This report by the American Council on Science and Health (ACSH) summarizes what science has learned about smoking cessation — with an emphasis on methods that have been proven to work. The report also describes some new smoking cessation techniques that are currently under development and evaluates some alternative methods that have been advocated as aids to smoking cessation. This report is not intended as a stop-smoking guide; instead, it is best used as a source of background information to complement the stop-smoking advice available from local and national health organizations, government agencies, and physicians.

BACKGROUND: THE MAGNITUDE OF THE PROBLEM

More than 46 million American adults currently smoke, and the number of adolescent smokers is increasing annually. Cigarette smoking contributes to more than 430,000 deaths in the United States each year.
Tobacco dependence is now recognized as a clinical addiction and even as a chronic disease — one of the most widespread in the world.

Quitting smoking has major health benefits. In the long term, smoking cessation reduces the risk of lung cancer and other cancers, stroke, heart disease, chronic obstructive pulmonary disease (chronic bronchitis and emphysema), and a host of other diseases. In the short term, quitting has some immediate health benefits such as reducing fatigue and shortness of breath and increasing arterial circulation and libido.²

Recent U.S. surveys show that among current smokers, nearly 41% had attempted to quit at least once in the previous year, and nearly 70% want to quit.¹ But only about 4–5% of smokers who try to quit each year succeed in stopping smoking permanently.¹ The prospects for successful smoking cessation are not as dismal as these numbers seem to indicate, however. The chance of success increases with each quit attempt and with the use of effective smoking cessation methods. After repeated attempts, nearly 40 to 50% of smokers eventually succeed in quitting. Presently, more than 45 million Americans have quit smoking, and the total number of smokers has slowly declined in recent years.¹

The first smoking cessation programs began in the 1950s, after research had shown that smoking was a serious health hazard. In 1955, public “stop smoking clinics” were introduced in Sweden; they used medications, pamphlets, lectures, and physician counseling to help people quit. These clinics spread to the rest of Europe and the United States in the 1960s and have evolved into what are now comprehensive, multifaceted, individualized programs.

Smoking cessation rates in the United States started to stabilize in the 1990s, after having increased over the prior few decades.¹ Evidence suggests that this is because the number of quit attempts as well as the success of each attempt stabilized.³ However, in 1990, only 10% of quitters used some form of treatment,⁴ whereas as many as 35% do so today.⁵ There are several ways to approach smoking cessation, and individuals must decide for themselves which program or method is right for them. However, the more programs and methods available — and the more a smoker is educated about quitting — the greater the likelihood of success.
THE SUCCESSFUL QUITTER

All smoking cessation programs have at least one thing in common — a flexible notion of what it takes to become a successful quitter. The prerequisites for success vary from individual to individual, but tend to include the following:

Motivation, Desire, Commitment: Smokers who choose to quit should have strong personal reasons that motivate them to do so. People who attempt to quit solely to please others are usually headed for failure. Successful quitters must make a firm commitment to stop.

Timing: The time at which a smoker chooses to quit is very important to the outcome. A quit attempt can temporarily affect a person’s lifestyle, state of mind, and general wellbeing. Trying to quit in the midst of an important business deal or a difficult family or personal situation can lower the chances of success.

Choice of Method: No particular smoking cessation method is right for everyone. However, the U.S. Public Health Service (USPHS) suggests that all smokers trying to quit should use some form of drug therapy (such as nicotine replacement therapy or bupropion), if possible, in combination with some form of counseling, behavioral therapy, or social support. However, not all experts agree that pharmacological agents are needed by all smokers. Smokers should plan ahead and choose the methods that most closely conform to their personal needs. Since some types of medication are only available by prescription, it is a good idea for smokers to discuss their smoking cessation plans with a physician. Physicians can also provide counseling, and they can refer smokers to organized smoking cessation programs in the community.

Repetition: One of the main keys to successful quitting is repetition. Most smokers will try to quit several times before succeeding. With each attempt, the smoker learns more about what to expect from the quitting process, and the chance of success increases. Many smokers are not aware of this fact and may become needlessly discouraged when they relapse after an initial unsuccessful attempt.
Kicking Butts in the Twenty-First Century:

**MOTIVATORS FOR QUITTING**

Although smokers must make their own decisions to quit, several common factors often serve as motivators for quitting.

**Health Benefits:** Improved health seems to be the primary motivator for quitting. Many of the adverse health effects of smoking can be greatly reduced or even reversed through cessation. Immediate benefits of quitting include a decrease in blood pressure, a lowered pulse rate, an increased oxygen level in the blood, and a decreased blood carbon
monoxide level. Also, the ability to smell and taste is enhanced. After two weeks of abstinence, circulation to the extremities improves, blood pressure remains lower, and lung function improves. After just a few weeks to a month, cough, sinus congestion, fatigue, and shortness of breath all decrease, although cough may actually worsen right after quitting. Further, ex-smokers are less likely than current smokers to have colds, develop gum disease, experience fertility problems, or experience erectile dysfunction.

Long-term benefits may also motivate smokers to quit. One year after quitting, the risk of developing symptomatic coronary artery disease (e.g., angina) is reduced by nearly half compared to those who continue to smoke. And after as little as two to five years, that risk can be decreased to levels approaching those who have never smoked. After five years of abstinence, the risk of stroke is reduced, approaching that of people who have never smoked. The risk of lung cancer decreases with the number of years of abstinence and can be reduced by as much as 40% after ten years; however, it never returns to that of people who have never smoked. The risk of other cancers such as those of the mouth, throat, esophagus, bladder, kidney, and pancreas also decreases after several years of abstinence. After nearly fifteen years of abstinence, the overall risk of mortality tends to approach a level similar to that of lifelong nonsmokers. Unfortunately, quitting does not reverse chronic obstructive lung disease (chronic bronchitis or emphysema), but it does slow its progression. For women who stop smoking before pregnancy or during the first trimester, the risk of having a low-birthweight baby is decreased. Because the reversibility of the risks of smoking is greatly influenced by the duration of smoking prior to quitting, smokers should be encouraged to quit as soon as possible.

Social Pressure: The increasing social pressure from tobacco control efforts may motivate smokers to quit. For example, workplace and public space restrictions — including recent bans or proposed bans on smoking in restaurants and bars in many locations — can increase the motivation or stimulus to quit.

The institution of totally smoke-free workplaces can motivate some people to quit smoking. A recent combined analysis of 26 studies showed that smoke-free workplaces encourage smokers to either quit or decrease their smoking, thus reducing total cigarette consumption per employee by an average of 29%.
Anti-tobacco campaigns and anti-smoking messages in the media can also provide some much-needed motivation and may cause smokers to worry about the effect of smoking on their family’s health and well-being. Parents who smoke may be motivated to try to quit when they learn that exposure to tobacco smoke in the environment is harmful to the health of their children or another loved one. In addition, it is well known that children of parents who smoke are more likely to become smokers themselves. Fortunately, if a parent quits while a child is young, that child has a lower chance of becoming a smoker than if the parent continues to smoke.

*Personal Requests:* Many smokers receive personal requests to quit from family members, friends, and physicians who are concerned about the smoker’s health and/or are bothered by their habit. Although one request may not be enough motivation, each subsequent request may increase a smoker’s probability of quitting.

*Economic Aspects:* Although health is usually the main motivator for quitting, the economic cost and burden of the habit may also influence some smokers’ decisions. Depending on the individual, smoking can be quite expensive — costing as much as $70.00-80.00 per week. Recently, many states have increased cigarette taxes, raising the cost of a pack of cigarettes by more than a dollar in some areas. (In New York City, the combination of city and state taxes increases the cost of cigarettes by almost *three dollars* a pack.) Although the main public health objective of raising the price of cigarettes is to deter adolescents from smoking, increasing cigarette prices does seem to increase smoking cessation. The economic benefits of quitting may be especially important for the 30% of smokers who have incomes below the national poverty level.

The cost of cigarettes isn’t the only economic cost of smoking. Smokers’ health care expenses are as much as 21% higher than those of nonsmokers. It is estimated that smoking costs the U.S. $158 billion each year in productivity losses and excess medical expenditures.
**BARRIERS TO QUITTING**

So, exactly how hard is it to quit smoking? The answer to this question differs among individuals. Success in quitting is related to personal characteristics, the length of smoking history, the level of cigarette use, the intensity of addiction, and the smoking cessation methods utilized. Those smoking more cigarettes for a greater time period may find it more difficult, but by no means impossible, to quit. Some studies show that women find it harder to quit than men do, although the reasons for this are unclear.

There are several common barriers to quitting. While these vary from one individual to the next, major barriers that most smokers can expect to encounter include the following:

*Withdrawal:* Probably the greatest barrier to quitting — and the hardest for smokers to overcome — is withdrawal. Withdrawal is the body’s response to the physical need for nicotine and the psychological need or desire for a cigarette. Immediately after quitting, many smokers will experience headache and dizziness, coughing and sore throat, and hunger. These symptoms usually last a few days to a week. As cessation progresses, other symptoms can develop, including anger, frustration, irritability, difficulty in concentrating, impatience, insomnia, fatigue, and even intense anxiety and depression. Also, because of the body’s dependence on nicotine, the most common symptom is intense nicotine craving, or the overpowering desire to smoke. The physiological symptoms and psychological desire to smoke are the major factors in relapse (resumption of smoking). The use of nicotine replacement therapies in a smoking cessation program can help ease the symptoms of withdrawal. Physical withdrawal typically peaks at one to three weeks after quitting; “psychological withdrawal” and the desire for a cigarette can last anywhere from weeks to a few years, but for most people not much more than six months.

*Behavioral Addiction:* Behavioral, or psychological, addiction to or dependence on the practice of smoking may make quitting difficult. Many people associate smoking with other actions or situations such as eating, drinking, and social or stressful events — associations that are sometimes hard to change. Also, many smokers enjoy the oral activity of smoking a cigarette and the physical comfort of holding it between their fingers.
Social Circumstances: Another barrier to cessation can be the presence of smokers in the household, workplace, or social or recreational environments. This can deter smokers from trying to quit or provoke smokers to relapse by providing an unsupportive environment or easy access to cigarettes. Many smokers are so-called social smokers; they find it difficult to be in a social environment without smoking.

Existing Mental Problems: People with psychiatric disorders, such as anxiety or depression, have higher smoking rates than other people do. It is possible that some of these people smoke to abate the symptoms of these disorders. Successfully treating the anxiety or depression might increase the likelihood of successful smoking cessation; however, this idea has not yet been evaluated directly.

Difficulties Gaining Access to Treatment: Some smokers do not have easy or affordable access to smoking cessation treatments. Some smoking cessation products require a prescription, and most are not covered by insurance plans. Increasing the number of over-the-counter medications, reducing the cost of some treatments, and extending insurance coverage should improve cessation outcomes.

Relapse: The occurrence of relapse is another barrier to cessation. Many smokers who try to quit on their own will suffer a relapse at some point. Those who use drugs or counseling to help them quit have an increased chance of success, but the majority experience some form of relapse. A relapse can set smokers back to the point where they abandon the quest for cessation.

SMOKING CESSATION METHODS

There are several treatments currently available for use in smoking cessation. The two approaches for which there is the most evidence of efficacy are drug therapy (nicotine replacement therapy or bupropion) and counseling/support. Each of these types of treatment is effective on its own; however, using both in combination leads to the highest success rates.
GOING IT ALONE

Although treatment is available, many people prefer to try to quit smoking on their own — either by the “cold turkey” method (giving up cigarettes suddenly and completely) or by gradually decreasing their smoking. Quitting on one’s own is convenient and inexpensive. However, this approach to smoking cessation does not address any of the physical withdrawal symptoms or psychological consequences associated with quitting and does not teach coping methods for remaining cigarette-free. Some studies indicate that people who quit cold turkey experience a shorter period of withdrawal than those who quit by gradual reduction, and that the body rids itself of nicotine within 48 hours. Nearly 70% of smokers who try to quit cold turkey resume smoking within two days, and 80% do so within a month.²⁰

DRUG THERAPIES

The use of approved medications can increase the chance of long-term abstinence from tobacco. All smokers trying to quit should consider the use of medications discussed below and should discuss their options with a physician. Those smoking fewer than 10 cigarettes per day, women who are pregnant or breastfeeding, and adolescent smokers may use the approved therapies but may require alterations in treatment or close monitoring by a physician.⁶ (See Table 1 on p. 16 for a comparison of the drug therapies available for use in smoking cessation.)

First-Line Medications

There are currently six first-line medications considered safe and effective and approved by the U.S. Food and Drug Administration (FDA) for tobacco dependence treatment. These include five forms of nicotine replacement therapy — gum, inhaler, lozenge, nasal spray, and patch — as well as the non-nicotine medication bupropion. These first-line medications have an established scientific record of efficacy. Most smokers can and should use them; however, special precautions may be needed for smokers with certain medical problems or for pregnant women. These medications have few side effects (fewer than 5% of users stop using the medications due to side effects), are considered equally effective, and can nearly double the chances of quitting smoking successfully. There is no method to scientifically match a patient to a specific
<table>
<thead>
<tr>
<th>First-Line Therapies</th>
<th>Availability</th>
<th>Dosage (Average)</th>
<th>Duration</th>
<th>Cost/Day</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nicotine Replacement Therapies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nicotine Gum</td>
<td>OTC</td>
<td>2 mg, 4 mg pieces 10 pieces/day</td>
<td>1-3 months</td>
<td>$6.00-7.00</td>
</tr>
<tr>
<td>Nicotine Inhaler</td>
<td>Prescription</td>
<td>4 mg cartridge 6-16 cartridges/day</td>
<td>3-6 months</td>
<td>$5.70</td>
</tr>
<tr>
<td>Nicotine Lozenge</td>
<td>OTC</td>
<td>2 mg, 4 mg lozenges 1 lozenge/1-2 hours</td>
<td>3 months</td>
<td>$6.00-10.00</td>
</tr>
<tr>
<td>Nicotine Nasal Spray</td>
<td>Prescription</td>
<td>0.5 ml spray to each nostril 8-40 doses/day</td>
<td>3-6 months</td>
<td>$5.00-15.00</td>
</tr>
<tr>
<td>Nicotine Patch</td>
<td>OTC/Prescription</td>
<td>21 mg, 14 mg, 7 mg 16 hour, 24 hour</td>
<td>2 months</td>
<td>$4.00</td>
</tr>
<tr>
<td><strong>Non-Nicotine Therapies</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bupropion</td>
<td>Prescription</td>
<td>150 mg, twice daily</td>
<td>3 months</td>
<td>$4.00</td>
</tr>
<tr>
<td><strong>Second-Line Therapies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clonidine</td>
<td>Prescription</td>
<td>0.10 mg/day initially increase 0.10 mg/day per week if necessary</td>
<td>3-10 weeks</td>
<td>$0.24</td>
</tr>
<tr>
<td>Nortriptyline</td>
<td>Prescription</td>
<td>25 mg/day for first 10-28 days increase to 75-100 mg/day</td>
<td>3 months</td>
<td>$0.74</td>
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</tbody>
</table>

Table 1. **Comparison of Drug Therapies For Use in Smoking Cessation**

Treatment. Therefore, choice of treatment depends on individual preference, what is appropriate for a particular lifestyle, and how helpful the individual smoker finds the medication to be.
Nicotine Replacement Therapy (NRT)

The concept behind nicotine replacement therapy is to address nicotine dependence and minimize withdrawal symptoms by replacing the nicotine from cigarettes with an alternative nicotine source. This helps the smoker to adapt to not smoking and to develop behavioral techniques to break the cigarette habit while still receiving the nicotine “fix” in a controlled manner. As smokers progress with cessation, they can then slowly taper the nicotine dose until it is no longer needed.

The idea of using a potentially harmful drug — nicotine — as a medical treatment may seem strange at first, but it makes sense because smokers are already being exposed to nicotine — in the very dangerous form of cigarettes. In addition to nicotine, cigarettes contain numerous poisons such as carbon monoxide and cyanide, a large number of cancer-causing agents, and other harmful substances. Nicotine replacement therapy (NRT) products contain nicotine and only nicotine, so they expose the user to just one potentially dangerous substance, unlike smoking. Although high doses of nicotine may have some harmful effects on the body, it does not appear to be a cancer-causing agent, and it does not play a major role in the development of heart disease.\(^1\,^2\,^1\) Thus, when people stop smoking and start to use NRT, they are already reducing their health risks.

However, since nicotine is the addictive agent in cigarettes, some public health officials are concerned that NRT medications themselves will cause dependence.\(^2\,^2\) The nicotine levels in NRTs are much lower than those in cigarettes, though, and the nicotine in some NRTs is absorbed more slowly than it is from cigarettes. Thus, the potential for dependence is rather small.

For all NRTs, caution should be taken for pregnant and lactating women, individuals who have recently had a heart attack (within two weeks), and those with serious cardiovascular disease including arrhythmias or angina.\(^6\) Pregnant and lactating women should be encouraged to quit first without NRT, as it is not completely clear to what extent nicotine causes harmful effects on the fetus or nursing infant.\(^2\,^3\) However, NRTs produce lower levels of nicotine in the body than cigarettes do, and they do not expose the user to carbon monoxide (which is thought to be harmful to the fetus) the way that smoking does. Thus, some experts suggest that pregnant women can use NRT if the likelihood of
abstinence without it is minimal. For people with cardiovascular disease, studies have shown that it is possible to use NRT with little risk; however, it is very important that patients are monitored closely and that cigarettes are not used along with NRT.

The FDA and manufacturers of NRT products strongly advise against smoking while using any form of NRT. Smoking while using NRT can lead to a harmful overload of nicotine in the body. In the case of the nicotine patch, users also should not smoke within a few hours after removing a patch because the nicotine from the patch remains in the bloodstream for several hours after the patch is removed.

NRT users should remember that NRT does not work equally well for everyone and does not completely eliminate the withdrawal symptoms associated with smoking cessation. Further, it will not magically allow or motivate the smoker to quit. What it does do, however, is add another weapon to the arsenal of techniques that can help people quit.

**Nicotine Gum (Nicorette)**

Nicotine polacrilex (nicotine gum) is designed to deliver nicotine orally. The gum was approved by the FDA in 1984 and made available exclusively over the counter in 1995. Generic brands are available. It comes in doses of 2 milligrams (mg) (recommended for those who smoke fewer than 25 cigarettes per day) and 4 mg (for those who smoke 25 or more cigarettes per day). Studies show that the gum can improve long-term abstinence rates by 30 to 80% compared to placebo, and the 4 mg dose is more effective than the 2 mg dose in highly dependent smokers.

The gum is not meant to be chewed in the way that ordinary gum is chewed. Instead, it is inserted in the mouth, chewed a few times until a peppery or minty flavor is sensed and nicotine released, and then placed between the gum and cheek. This action should be performed intermittently for 30 minutes or until the taste subsides. This is called “park and chew.” If a user fails to “park” the gum, the nicotine will be released into the saliva and swallowed; this may cause nausea. Parking allows nicotine to be absorbed through the lining of the mouth into the circulation. The nicotine takes several minutes to reach the brain and thus results in a less intense “hit” than that produced by smoking. (Smoking delivers nicotine via the lungs to blood that travels to the brain.)
Approximately 50% of the nicotine in the gum will be released and absorbed. Food and beverages can interfere with the efficacy of the gum, so users should not eat or drink anything except water for 15 minutes before, during, or after chewing. Users should chew an adequate amount of gum on a fixed schedule in order to achieve the maximum benefit. Many users do not chew enough pieces per day or do not do so for a sufficient number of weeks. The typical daily dose is 10 pieces for a maximum daily nicotine dose of 60 mg, and the recommended duration is for 1 to 3 months, although this can vary.27

Nicotine gum has some advantages over other NRT products: it provides faster nicotine delivery than some of the other NRT products, more effectively satisfies cravings induced by certain situations, is relatively discreet, and is readily available. Some disadvantages are unpleasant taste, the need to use multiple pieces per day, and potential side effects such as jaw ache, mouth soreness, nausea, and stomachache. The average cost of the gum is $6.00-7.00 per day (depending on the dose), or approximately $40.00-50.00 for one week’s supply.6

Nicotine Inhaler (Nicotrol Inhaler)

The nicotine inhaler, or “puffer,” is a device consisting of a mouthpiece and a thin, plastic cartridge that contains a 4 mg nicotine plug. The inhaler was introduced in 1998 and is available only by prescription. Each cartridge delivers as many as 400 puffs of nicotine vapor, though it takes nearly 80 puffs to obtain the amount of nicotine that one gets from smoking one cigarette. Studies show that the nicotine inhaler, compared with a placebo inhaler (an inhaler containing an inactive substance instead of nicotine), more than doubles long-term quit rates.6

Although this product is labeled as an inhaler, it actually delivers nicotine through the mouth — as the gum does — rather than though the lungs as cigarettes do. When the urge to smoke occurs, the user places the cartridge into the mouth and puffs in either shallow or deep breaths. This passes the vaporized nicotine into the back of the mouth and throat, where it is absorbed through the lining of the mouth. Users generally need to puff frequently for approximately 20 minutes (or one cartridge) to get the 4 mg dose of nicotine, of which 2 mg will be absorbed — equivalent to the nicotine in two cigarettes. Users should note that cold temperatures (below 40°F) can decrease the amount of nicotine that is extracted from the inhaler. To compensate, in cold weather the device
should be kept in a warm place. Also, food and beverages can affect the absorption of nicotine and should be avoided before, during, and after use to achieve maximum benefit. Users may need to use anywhere from 6 to 16 cartridges per day during the first 6 to 12 weeks and then can taper the number of cartridges over the subsequent 3 months. The manufacturer and public health officials recommend against using the inhaler for longer than 6 months.6,28

One advantage of the inhaler is that it can be used to address nicotine cravings and delivers nicotine as quickly as the gum does. Also, the product mimics the inhaling process and hand-to-mouth behavior of smoking, which may serve as a comfort to those trying to quit. However, some may see this as a disadvantage because for many smokers trying to quit, breaking the behavioral habit of smoking is an important part of the smoking cessation process. The most common side effect of the inhaler is irritation of the lining of the mouth (about 40% of users), but coughing, runny nose, and stomachache are also experienced by some users.6 However, these symptoms are often mild and usually diminish with regular use. The average cost of the inhaler is $5.70 per day, or $40.00 for a one-week supply, in addition to any doctor’s or prescribing fee required.29

**Nicotine Lozenge (Commit)**

This is a lozenge releasing small amounts of nicotine that is absorbed through the lining of the mouth and gums. The lozenge has been available in Europe for many years but has just recently been approved by the FDA for smoking cessation purposes.30 The lozenges are available OTC (over the counter) in doses of 2 mg and 4 mg. Users should let the lozenge slowly dissolve in the mouth and may experience a warm or tingling sensation. Users should move the lozenge from one side of the mouth to the other until it has completely dissolved (approximately 20-30 minutes) and should not chew or swallow the lozenge. Users also should not eat or drink while using the lozenge, nor within 15 minutes before.

The recommended lozenge dose is determined by how soon a smoker has a cigarette after waking up in the morning. For example, if a smoker smokes within 30 minutes after waking, the 4 mg is recommended. If it is longer than 30 minutes, the 2mg is recommended. Users should take 1 lozenge every 1-2 hours per day during the first 6 weeks, then
every 2-4 hours in weeks 7 through 9, and finally every 4-8 hours for
weeks 10 through 12. Lozenges should not be used for more than 12
weeks. The manufacturer recommends using only one lozenge at a time
and allowing some time between lozenges, as doing otherwise could
cause side effects such as hiccups, heartburn, or nausea. Also, users
should not consume more than 20 lozenges daily. The cost is $39.95 for
72 lozenges.

**Nicotine Nasal Spray (Nicotrol NS)**

The nicotine nasal spray is a spray pump containing aerosolized nico-
tine that is delivered into the nostrils and absorbed through the nasal
membranes. This product was introduced in 1996 and is available by
prescription in a quantity of 10 milliliters (ml). Each 0.05 ml spray
delivers 0.5 mg of nicotine, and one dose consists of one spray to each
nostril, for a total of 1 mg of nicotine. The nicotine nasal spray delivers
nicotine more rapidly than other NRTs do, thus making it attractive to
highly dependent smokers. The spray can more than double long-term
quit rates compared to placebo sprays.6

The nicotine nasal spray is similar to over the counter decongestant
nasal sprays. The spray should be administered with the head tilted
slightly back, and users should not sniff, swallow, or inhale through the
nose while the spray is administered. Initially, one spray should be
administered to each nostril once or twice per hour, or more frequently
as needed, up to a maximum of 40 doses (40 mg) per day (or 5 doses
per hour), for 6 to 8 weeks. The minimum recommended dosage is 8
doses per day for 3 to 6 months. Manufacturers suggest that for the opti-
 mum benefit from treatment, users should begin to taper doses after 3
months in order to prevent withdrawal symptoms.

The major advantages of the nasal spray are that it can address sudden
nicotine cravings within minutes of use and it provides higher levels of
nicotine, allowing the user to “self-dose” as necessary. But there are
some side effects associated with use of this product, including irritation
of the nasal passage, sinuses, and throat; coughing; and sneezing. More
than 75% of users report such side effects.26 However, these side effects
usually subside and become more tolerable over time, usually after the
first week as users learn how to use the nasal spray correctly. People
with severe asthma, allergies, or other reactive airway diseases should
not use the nasal spray without discussing it with a physician.
Users should be aware that there is a slightly greater dependency potential for the nasal spray compared to the gum or patch — 15-20% of patients reported using the spray for longer than recommended (6-12 months), and 5% used it at a dose that was higher than recommended. Those concerned with ongoing addiction may want to consider other NRTs or other medications. The average cost of the spray is $5.00 per day (average of 13 doses) and as much as $15.00 per day for maximum usage (40 doses), in addition to any doctor’s or prescribing fee required.

**Nicotine Patch (Habitrol, Nicoderm CQ, Nicotrol)**

The nicotine patch, or transdermal nicotine, is a self-adhesive strip that is applied to the skin and releases nicotine into the outer layer of the skin in various doses and intervals. The nicotine in the patch may take as long as three hours to be absorbed through the skin and into the bloodstream. Thus, the patch must be worn for extended periods of time so that the user maintains a constant blood level of nicotine. The patch was introduced in 1992 and is available by prescription or over the counter through three major brands. Generic patches are also available. Similar to other NRTs, patch use can double long-term quit rates compared to placebo.

The 24-hour patch is available in 21 mg, 14 mg, and 7 mg doses, depending on the brand (generic brands have additional doses). A new patch is applied to the skin each morning, usually on the abdomen between the neck and the waist or the upper arm or shoulder, and the location of the patch should be periodically rotated. According to manufacturers, the patch should be used for 4 to 10 weeks; however, studies show that treatments of 8 weeks duration work as well as longer treatments. Highly dependent smokers — or those smoking more than 10-15 cigarettes per day — should begin with the highest possible dose and may opt initially for the 24-hour patch. Less dependent smokers — or those smoking fewer than 10 cigarettes per day — should start with a lower dose. Manufacturers also recommend, in general, starting with a higher dose and then tapering over 2-4 months. For example, the recommended taper is 21 mg for 4 weeks, then 14 mg for 2 weeks, and finally 7 mg for 2 weeks. The 16-hour patch comes in doses of 15 mg, 10 mg and 5 mg. It should be applied in the morning and removed before bedtime. The recommended duration of treatment is 8 weeks.

There are several advantages of the patch, including that it is very easy
to use, it comes in various doses, so the user can taper the dose as progress is made, it need only be used once a day to provide a continual stream of nicotine, and it is inconspicuous. One disadvantage to the patch is that it releases nicotine more slowly than other NRTs do and therefore cannot be used to combat sudden nicotine cravings.

There are minimal side effects associated with the patch. The main side effect is a localized rash and skin irritation many users develop from the actual patch — approximately 50% of users experience such a reaction, but less than 5% actually have to stop using the product. Users can treat these reactions with hydrocortisone or triamcinolone cream and rotate the location of the patch as recommended. Further, people with existing skin conditions, such as eczema, or allergies to adhesives should be cautious about using the patch and consider alternative NRTs.

Another potential side effect from the nicotine patch is sleep disturbance. This usually occurs in those using the 24-hour patch, because users are unaccustomed to having nicotine in the system while asleep. This can produce insomnia. Sleep disturbance can be prevented by using the 16-hour patch or by removing the 24-hour patch during sleeping hours. However, taking the patch off at night can leave the user with an intense cigarette craving first thing in the morning. The average cost of the patch is $4.00 per day, or about $30.00 for a one-week supply.

*In development:* Attempts were recently made to market several other nicotine-containing products in the U.S., including nicotine-containing water, lollipops, and lip balm. However, these products were taken off the market because they did not have FDA approval for use in smoking cessation.

**Medications Other than Nicotine Replacement Therapy**

**Bupropion SR (Zyban/Wellbutrin)**

Bupropion SR (sustained-release) was the first non-nicotine medication approved to treat tobacco dependence. This drug, which is also used as an antidepressant, was made available by prescription for smoking cessation purposes in 1997, under the brand name “Zyban.” Researchers presume that blocking reuptake of the neurotransmitters dopamine and/or norepinephrine is what makes this drug effective; however, this
has not been definitively established. Bupropion is considered a first-line therapy because it has been proven effective in helping smokers quit; research shows that using bupropion can nearly double quit rates compared to placebo. This is equivalent to the benefit achieved with NRT.

Users are advised to begin taking bupropion approximately 1-2 weeks before they plan to quit, as this is the amount of time required to achieve a steady blood level of the medication. The recommended dose is 150 mg daily for 3 days, then 150 mg twice daily (for a daily total of 300 mg) for up to 12 weeks. For maintenance therapy, bupropion can be used for up to 6 months, which is the FDA-approved duration. However, new research shows that using the medication for up to 12 months is both safe and effective at preventing relapse. Treatment duration should be discussed with a doctor and geared towards the individual’s progress. However, those not making significant progress in quitting by the seventh week should consider discontinuing the attempt and stop taking bupropion.

Bupropion offers many benefits to those trying to quit. Because bupropion treatment must be initiated before the quit attempt, it prepares a smoker’s body for the actual stress of quitting. Many people like bupropion because it is an alternative to traditional nicotine replacement, or because they have previously tried NRT without success. Further, this therapy is in the form of a twice-daily pill, which is an easy regimen to follow. Another benefit of bupropion is that the side effects are minimal. The most common side effects are insomnia (in 35-40% of users) and dry mouth (10%). Users can minimize the risk of insomnia by abstaining from a dose near bedtime or by taking it much earlier in the afternoon or evening (though doses should be taken in intervals of at least 8 hours). Less common side effects include shakiness, skin irritations, headaches, and dizziness.

The major drawback of bupropion is that people with a history of seizures or eating disorders and those taking a monoamine oxidase (MAO) inhibitor or another medication containing bupropion (such as Wellbutrin to treat depression) should not use bupropion for smoking cessation purposes. In addition, similar to recommendations for NRTs, pregnant and lactating women should be encouraged to quit first and consider bupropion only when the prospect of quitting without it is minimal. Although there is no evidence of danger to a fetus or nursing
infant, women who are pregnant or lactating should check with a physician prior to starting this or any other medication. The average cost of bupropion is approximately $4.00 per day, plus any necessary doctor’s or prescribing fee.

**Second-Line Medications**

There are also two second-line medications that may be helpful to smokers — clonidine and nortriptyline — in addition to or instead of nicotine replacement therapy. Second-line medications have evidence of being effective in helping smokers to quit; however they are not FDA-approved specifically for tobacco dependence treatment and have an increased potential for side effects compared to first-line therapies. These treatments should be explored on a case-by-case basis and only after first-line medications have been utilized and determined ineffective. As with first-line therapies, pregnant and lactating women should first be encouraged to quit without pharmacologic treatment and to use these medications only if the chances of quitting without them are minimal.

**Clonidine (Catapres)**

Clonidine is a prescription medication used primarily for treating high blood pressure. However, studies show that clonidine can be effective in treating tobacco dependence and nearly doubles quit rates compared to placebo. Clonidine can be administered orally or via a skin patch, and although an official dosing regimen for smoking cessation has not been established, the preliminary recommendation is 0.10 mg daily, increasing by 0.10 mg/day per week if needed, for 3-10 weeks. Users should begin the medication 3 days prior to quitting. Users should not stop taking clonidine abruptly because side effects such as dry mouth, drowsiness, dizziness, headaches, and sedation may occur. Rebound hypertension (rapid increase in blood pressure) may occur if the medication is stopped abruptly. Instead, users should taper the dose over a period of a few days before discontinuing treatment. The average cost of clonidine is $0.24 per day.

**Nortriptyline HCl (Aventyl, Pamelor)**

This prescription medication is FDA-approved as an antidepressant. Like bupropion, which is also an antidepressant, it has been shown to be effective in helping smokers quit. Treatment is initiated 10 to 28 days...
prior to quitting, at a recommended dosage of 25 mg per day initially, increasing to 75-100 mg per day, for a duration of 12 weeks. Common side effects include sedation, dry mouth, blurred vision, urinary retention, lightheadedness, and shaky hands. Because of the sedative effect of nortriptyline, users should take extra caution while driving and operating machinery. Also, because this medication increases the risk of arrhythmias, patients with cardiovascular disease should discuss the use of nortriptyline thoroughly with their doctors. The risk of overdose is high and the drug may produce cardiotoxic effects. The average cost is $0.74 per day.

**Combination Therapy**

Combining drug therapies has been suggested as a way to improve quit rates, compared to using one treatment alone. However, the FDA has not approved any specific combinations, and thus any combination is considered a second-line treatment. Based on various research studies, the USPHS recommends using one therapy that provides a steady dosing of nicotine or other smoking cessation medication in the bloodstream and adding a therapy that can readily address nicotine cravings. For example, using the patch in combination with a self-administered NRT such as the gum, inhaler, or nasal spray is more effective than using one NRT alone. Also, using bupropion with the patch has been shown to increase quit rates significantly compared to using either the patch alone or placebo. Because combination therapy usually results in higher blood levels of nicotine than the use of a single NRT and could possibly cause nicotine overdose, and because combination therapy is relatively new, users should only consider combination therapy if they are highly addicted smokers, if one-drug therapy has failed, and they are following a doctor’s recommendation.

**Medications Not Recommended**

The USPHS does not recommend any drug therapies for use in smoking cessation other than those already mentioned. Medications that are not recommended include antidepressants other than bupropion and nortriptyline; anti-anxiety drugs, benzodiazepines (a class of anti-anxiety drugs), and beta-blockers; silver acetate; and mecamylamine. Research has not demonstrated that these medications are effective as aids to smoking cessation.
COUNSELING AND SUPPORT

There are several forms of counseling and support available that can help smokers cope with the physical, mental, and behavioral aspects of quitting. Counseling and support are an integral part of the quitting process and can be used either alone or in combination with drug therapy (see Table 2 for additional smoking cessation resources).

Table 2. Smoking Cessation Resources

NATIONAL ORGANIZATIONS

- American Cancer Society
  1599 Clifton Road, NE
  Atlanta, GA  30329-4251
  American Psychiatric Assoc.
  (800) ACS-2345
  www.cancer.org

- American Lung Association
  1740 Broadway
  New York, NY  10019
  (800) LUNG-USA
  www.lungusa.org

- American Heart Association
  National Center
  7272 Greenville Avenue
  Dallas, TX 75231
  (800) AHA-USA-1
  www.americanheart.org

- Campaign for Tobacco-Free Kids
  1400 Eye Street, Suite 1200
  Washington DC 20005
  (202) 296.5469
  www.tobaccofreekids.org

- National Cancer Institute
  9000 Rockville Pike
  Building 31 10A16
  Bethesda, MD  20892
  (800) 4-CANCER
  www.nci.nih.gov

- Nicotine Anonymous
  NAWSO
  PO Box 591777
  San Francisco, CA  94159-1777
  (415) 750-0328
  (415) 750-0328
  www.nicotine-anonymous.org

- Society for Research on Nicotine & Tobacco
  7611 Elmwood Avenue
  Middleton, WI  53562
  (608) 836-3787
  www.srnt.org

- American Legacy Foundation
  1001 G Street, NW, Suite 800
  Washington, DC 20001
  (202) 454-5555
  www.americanlegacy.org

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All smokers trying to quit should consider counseling in order to address some of the behavioral hardships associated with cessation. Counseling can help a smoker learn practical tactics that are effective in treating tobacco dependence. The smoker needs to recognize situations that may trigger relapse. These may include being in the presence of other smokers, whether at home, work, or in a social situation; drinking alcohol, which is a common initiator of smoking in many individuals; and experiencing stressful situations. These situations will vary from one smoker to the next. Counseling can help smokers identify these smoking “cues” and develop behavioral coping skills to learn how to break the link to what urges them to smoke. For example, asking friends and family to avoid smoking in one’s presence is a coping skill.
that can help the smoker avoid temptation. Also, committing to lifestyle changes that increase pleasure and reduce stress, such as increased exercise and taking up a hobby, can help in a difficult situation.

Many different types of counseling are available, ranging from individual sessions to support groups and telephone counseling. Any communication directed towards encouraging the smoker to quit seems to be of some benefit, and the USPHS recommends using at least one type. Using multiple forms of counseling or support may be even more effective.

Support Groups

Counseling and behavioral therapies were initially developed for use in a group format, in order to provide a supportive environment for those trying to quit. Social support in general increases the chances of quitting, and support groups can teach behavioral coping skills and introduce members to partners or buddies who are trying to quit. Group members can also offer each other personal tips on how to stay cigarette-free. Group counseling programs should be at least 20-30 minutes long, offered a few times per week, and last for more than two weeks. Although group programs can increase long-term abstinence rates by as much as 25-40%, few smokers actually attend them.

Individual Counseling

Individual counseling sessions are also an option. This form of behavioral therapy increases the chances of quitting — perhaps more so than other types of counseling. Brief advice from a physician to an individual, lasting as little as 3 to 5 minutes, has been shown to produce higher cessation rates than no advice. And the more time spent with the individual, the better the outcome. A smoker should look for a trained counselor or a physician with whom he/she feels comfortable and easily able to discuss the difficulties of cessation. Individually tailored sessions that address the specific problems of a smoker are most desired; however, this format can be expensive.

Telephone Counseling

Telephone counseling also seems to improve quit rates. Many state health departments, NRT manufacturers, and nonprofit organizations offer free telephone counseling or “quitlines.” Thirty-three states cur-
rently have some form of quitline, and other states are planning to follow suit (see Table 3 for information on those states offering smoking cessation resources). In an effective telephone program, the counselor will usually contact the smoker several times after the initial call to monitor progress and provide continued support and encouragement. Because of the confidentiality associated with telephone counseling, it may prove more acceptable and hence more effective than other forms of counseling for some people. It also can be used as an adjuvant to a prescription or OTC tobacco dependence medication.

Table 3. **States Providing Counseling and Information on Smoking Cessation**

<table>
<thead>
<tr>
<th>State</th>
<th>Quitline Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>1-888-842-QUIT (7848)</td>
</tr>
<tr>
<td>Alaska</td>
<td>1-888-842-QUIT (7848)</td>
</tr>
<tr>
<td>Arizona</td>
<td>1-800-556-6222</td>
</tr>
<tr>
<td>California</td>
<td>1-800-NO-BUTTS (662-8887)</td>
</tr>
<tr>
<td></td>
<td>1-800-45-NO-FUME (456-6386) (Spanish)</td>
</tr>
<tr>
<td></td>
<td>1-800-778-8440 (Vietnamese)</td>
</tr>
<tr>
<td></td>
<td>1-800-838-8917 (Mandarin and Cantonese)</td>
</tr>
<tr>
<td></td>
<td>1-800-556-5564 (Korean)</td>
</tr>
<tr>
<td></td>
<td>TDD: 1-800-933-4833</td>
</tr>
<tr>
<td></td>
<td>1-800-844-CHEW (2439) (Smokeless Tobacco)</td>
</tr>
<tr>
<td>Colorado</td>
<td>1-800-639-QUIT (7848)</td>
</tr>
<tr>
<td></td>
<td>TTY: 1-866-228-4327</td>
</tr>
<tr>
<td>Connecticut</td>
<td>1-866-END-HABIT (363-4224)</td>
</tr>
<tr>
<td>Delaware</td>
<td>1-866-409-1858</td>
</tr>
<tr>
<td>Florida</td>
<td>1-877-U-CAN-NOW (822-6669)</td>
</tr>
<tr>
<td></td>
<td>TTY: 1-866-228-4327</td>
</tr>
<tr>
<td>Georgia</td>
<td>1-877-270-STOP (7867)</td>
</tr>
<tr>
<td></td>
<td>1-877-2NO-FUME (266-3863) (Spanish)</td>
</tr>
<tr>
<td></td>
<td>TTY: 1-877-777-6534</td>
</tr>
<tr>
<td>Illinois</td>
<td>1-866-QUIT-YES (784-8937)</td>
</tr>
<tr>
<td>Iowa</td>
<td>1-866-U-CAN-TRY (822-6879)</td>
</tr>
<tr>
<td>Louisiana</td>
<td>1-800-LUNG-USA (586-4872)</td>
</tr>
</tbody>
</table>

If information regarding your states is not listed, please call 1-800-425-3422 for additional resources.

* This information was provided by the New York Times, November 19, 2002.
What Modern Science Has Learned about Smoking Cessation

Maine 1-800-207-1230

Massachusetts 1-800-TRY-TO-STOP (879-8678)
1-800-8DEJALO (833-5256) (Spanish and Portuguese)
TDD: 1-800-833-1477

Michigan 1-800-834-4781 (Medicaid)
1-800-537-5666 (Printed Materials)

Minnesota 1-877-270-STOP (7867)
1-877-2NO-FUME (266-3863) (Spanish)
TTY: 1-877-777-6534

Mississippi 1-800-244-9100

Nebraska 1-866-NEB-QUIT (632-7848)

Nevada 1-888-86-NONIC (866-6642)
1-702-877-0684 (Las Vegas)

New Hampshire 1-800-TRY-TO-STOP (879-8678)
1-800-8DEJALO (833-5256) (Spanish and Portuguese)
TDD: 1-800-833-1477

New Jersey 1-866-NJ-STOPS (657-8677)
TTY: 1-866-257-2971

New York 1-866-609-6292
TTY: 1-800-280-1213

Oklahoma 1-866-PITCH-EM (748-2436) (Tulsa County)
TTY: 1-866-228-4327

Oregon 1-877-270-STOP (7867)
1-877-2NO-FUME (266-3863) (Spanish)
TTY: 1-877-777-6534

Pennsylvania 1-877-724-1090
TTY: 1-866-228-4327

Rhode Island 1-800-TRY-TO-Stop (879-8678)
1-800-8DEJALO (833-5256) (Spanish and Portuguese)
TDD: 1-800-833-1477

South Dakota 1-866-SD-QUITS (737-8487)
TTY: 1-866-228-4327

continued on next page
Recently, several Internet sites have been developed to help smokers quit. These sites create a virtual support group and offer online counseling services similar to telephone counseling. Here smokers can also plan a quit attempt, track progress, chat with others trying to quit, and have access to smoking cessation resources and information. Internet programs are very flexible and can provide round-the-clock support. Research is underway to see if this type of counseling is effective, but preliminary results show that these virtual programs may help smokers quit at rates similar to those of in-person programs.

**Internet Programs**

Many self-help materials and programs are available, including pamphlets, books, videotapes, audiotapes, and others. However, the effectiveness of self-help when used alone is inconsistent, and success rates are similar to those experienced by smokers who do not use any counseling.6,43

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**Table 3. States Providing Counseling and Information on Smoking Cessation (continued)**

<table>
<thead>
<tr>
<th>State</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas</td>
<td>1-877-YES-QUIT (937-7848)</td>
</tr>
<tr>
<td>Utah</td>
<td>1-888-567-TRUTH (8788)</td>
</tr>
<tr>
<td>Vermont</td>
<td>1-877-YES-QUIT (937-7848)</td>
</tr>
<tr>
<td>Virginia</td>
<td>1-877-856-5177 (Printed Materials)</td>
</tr>
<tr>
<td>Washington</td>
<td>1-877-270-STOP (7867)</td>
</tr>
<tr>
<td>West Virginia</td>
<td>1-800-Y-NOT-QUIT (966-8784)</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>1-877-270-STOP (7867)</td>
</tr>
</tbody>
</table>
Aversive Smoking

The use of aversive smoking interventions, in which a smoker repeatedly smokes intensively and rapidly until the point of discomfort to associate smoking with negative feelings, can be effective in some smokers and may increase the likelihood of quitting. However, this approach to smoking cessation may pose a health risk to some individuals and should be monitored closely. This type of therapy is not commonly practiced today.

COMBINING MEDICATION WITH COUNSELING/SUPPORT

Using some form of drug therapy, such as NRT or non-nicotine medications as discussed above, in combination with some form of counseling or group support seems to produce the highest long-term success rates. The medications help treat the physical addiction to smoking, while counseling helps with the behavioral addiction. Thus a smoker can ease the nicotine addiction and develop coping methods for quitting, learn strategies for staying smoke-free, and receive general social support at the same time. Adding drug therapy to counseling can nearly double quit rates.

“ALTERNATIVE” THERAPIES

Although therapies such as acupuncture and hypnosis have become popular “alternative” ways to try to quit smoking, there is no clinical research to support the effectiveness of these therapies. The USPHS does not recommend these treatments and suggests that any effect is most likely due to a positive expectation that the therapy will help (placebo effect).

Acupuncture

This ancient technique of using needles to stimulate nerve endings thought to be associated with particular functions of the body has been proposed as an alternative treatment to help smokers quit. For example, acupuncturists think that certain spots in the ears, nose, and wrists may be correlated with the urge to smoke. However, no studies have supported this claim and thus smokers should be skeptical about whether this is a plausible therapy.
Hypnosis

For years, hypnosis has been used in an effort to diminish the subconscious desire to smoke. Although hypnosis may be helpful for some individuals, research does not support its efficacy, and it is not generally accepted as a standard form of therapy.6

Herbal Remedies

Some people have touted herbal medications such as St. John’s Wort (used as an antidepressant) and kava kava (used to relieve anxiety) as substitutes for approved smoking cessation medications. These herbal remedies have no proven benefit in helping smokers quit and may have harmful side effects.38 Since herbal remedies interact with some prescription and over-the-counter drugs, anyone who is taking any kind of medication — including medications used in smoking cessation — should not take herbal remedies without consulting a physician.

NEW APPROACH

Inpatient Treatment

Despite the treatments currently available, many smokers still do not achieve the ultimate goal of quitting permanently. Some researchers suggest that those who fail to quit after several tries with the available treatments may be more addicted than most to nicotine and thus in need of more intensive therapy.44 There are many inpatient facilities, or so-called “rehab” centers, for people who are addicted to other drugs, and researchers are exploring the possible use of this setting for combating nicotine dependence as well. The Nicotine Dependence Center at the Mayo Clinic in Rochester, Minnesota, provides a week-long residential inpatient treatment program for highly dependent smokers that combines intensive behavioral counseling with drug therapy. This program encompasses many facets of smoking cessation treatment and includes individualized nicotine replacement therapy, daily group and individual counseling sessions, seminars for stress reduction, diet and nutrition information, and exercise programs. Preliminary results suggest that this form of treatment is more effective than traditional outpatient treatment and could be an option for highly dependent smokers.45 After one year, as many as 45% of the inpatients remained abstinent, compared to 23% of a control group of people treated on an outpatient basis.
Inpatient treatment is substantially more expensive (the current cost is approximately $3,300 per week) than outpatient therapy; however, it may prove to be more cost-effective for some highly addicted smokers in the long term.

**FUTURE APPROACHES**

**Nicotine Vaccine**

A new development in the treatment of nicotine addiction is the prospect of an “anti-smoking” or nicotine vaccine. The nicotine vaccine works by producing antibodies that bind to nicotine and prevent the drug from reaching the brain, thus eliminating the reward effects that are usually produced upon smoking. The vaccine would most likely be used to end an existing addiction, protect former smokers from relapse, and prevent the onset of addiction. Animal studies have shown that the concept works, and a British biotechnology company recently announced that preliminary results from human trials indicate that the vaccine is safe and effective. The vaccine could offer many advantages over other smoking cessation treatments. The early versions are effective for 4-6 weeks, which could increase cessation rates. The vaccine will most likely be relatively inexpensive to manufacture and can be distributed widely. If the vaccine proves effective in preventing the onset of addiction, it could be used as a prevention method. The vaccine would not help smokers with the behavioral aspects of smoking, but it could be used in conjunction with the forms of counseling discussed earlier. U.S. companies are in the process of developing similar products — including an anti-smoking pill — and although this concept shows promise, it will be several years before a product is available.

**Nicotine Vaporization**

This is a new technology in development that is intended to deliver nicotine with a significantly smaller amount of carcinogens than cigarette smoking produces. A nicotine vaporization device heats tobacco, as opposed to burning it, causing the release of nicotine vapors. The manufacturer has also developed a smoking cessation plan based on this concept. Like other NRTs, the discs used in this method will come in various doses and then can be tapered as the desire for nicotine subsides. And like the nicotine inhaler, the device can be held like a cigarette, thus giving the smoker something to do with the mouth and hands.
This product is not currently approved by the FDA for smoking cessation purposes.

Harm Reduction

Harm reduction means encouraging smokers to alter tobacco use habits if they cannot be eliminated altogether in order to reduce the adverse health effects that result from smoking. Common, though often ineffective, methods for doing this include cutting back on the number of cigarettes smoked or switching to so-called “lite” or low-tar cigarettes. While these methods may sound good in theory, they are not always practical and do not eliminate the hazards of smoking. Smokers who attempt to smoke less sometimes compensate by inhaling more deeply and usually revert to prior smoking habits. “Lite” cigarettes are not less harmful, especially since smokers may inhale these more deeply, cover the filters with their fingers to take in as much “tar” and nicotine as with regular brands, or simply smoke more cigarettes.

The use of smokeless (also known as “chewing” or “spit”) tobacco in place of cigarettes to obtain nicotine is an alternative to smoking. Some individuals have found it a good way to help them stop smoking — not eliminating but at least reducing some health risks. Research into the usefulness of smokeless tobacco as an alternative to smoking is ongoing and controversial. It is well known, after all, that the use of smokeless tobacco poses health risks of its own, though they are small compared to smoking. Until and unless future research identifies harm reduction techniques that are safe and effective, smokers should try first to quit using the methods currently available.

**ADDITIONAL ISSUES IN SMOKING CESSION**

**WEIGHT GAIN**

Fear of weight gain makes many people hesitant to quit smoking. The truth is that most smokers do gain weight after quitting. The average weight gain is 5 to 10 pounds, but as many as 10% of people trying to quit will gain more than 30 pounds. This usually occurs because smokers snack or eat more to compensate for the lack of cigarettes and withdrawal symptoms. Also, many quitters experience an enhanced sense of taste and smell, which may increase the desire to eat. Others need to replace the behavioral aspect of smoking with eating.
Women, especially, are concerned with weight gain, and because nicotine suppresses appetite and increases metabolism, many women begin smoking or continue to smoke at least in part as a weight control measure. And the tobacco industry even uses weight as an advertising strategy. Women who quit smoking do tend to gain slightly more weight than men do. The use of nicotine gum and bupropion seems to delay the onset of weight gain after cessation, but once their use is discontinued the potential for weight gain usually returns. Smokers must remember that a slight weight gain is not as nearly harmful to health as the hazards from continued smoking. They should not let the fear of weight gain deter them from trying to quit.

In order to avoid or minimize weight gain, quitters should concentrate on eating a healthful diet and exercising regularly. They should not attempt to diet in the first few days or weeks after quitting because it would be difficult to concentrate on smoking cessation and dieting at the same time. In fact, dieting while attempting to quit may cause relapse. Exercise, however, has been shown to be effective in prolonging abstinence for women and delays weight gain when incorporated into a smoking cessation program.

**DEPRESSION**

There is a link between smoking and depression that can factor into an attempt to quit smoking: people who suffer from depression are more likely to be addicted to cigarettes than those who are not depressed, and smokers who experience more intense depression have a harder time quitting. Because bupropion is actually an antidepressant, it helps ease many of the symptoms of depression associated with trying to quit in addition to decreasing the urge to smoke. It is also possible that quitting smoking may precipitate a relapse of depression in smokers with a history of depression. Thus, prospective quitters with a history of depression might be well advised to seek medical and psychological monitoring when attempting to quit smoking.

**ALCOHOL**

There is also a strong link between smoking and alcohol consumption. Many smokers are “social smokers” who smoke mainly in social situations when they also drink alcoholic beverages. Those who drink heavily are also more likely to smoke heavily. Thus, reducing alcohol con-
sumption may actually help in smoking cessation, in addition to removing the smoker from tempting environments. In fact, in those people who suffer from alcohol dependency problems, a relapse to drinking may also cause a relapse to smoking. Conversely, continued smoking can cause a relapse to drinking. Choosing smoking cessation methods and programs that can address both of these issues is crucial to a successful quit attempt.

SPECIAL POPULATIONS

The USPHS has identified the following special populations for whom an adaptation in treatment for smoking cessation may be warranted. Taking these differences into consideration may help increase the number of individuals who successfully quit smoking.

Women: All smoking cessation treatments have been shown to benefit both men and women. However, smoking patterns can differ between men and women: women tend to smoke fewer cigarettes per day, smoke lower nicotine cigarettes, and do not inhale as deeply. Women may also experience more intense withdrawal symptoms. Women also face slightly different barriers to cessation than men do, including a more intense fear of weight gain, a greater likelihood of depression, and hormonal fluctuations. Some suggest that women smoke more for the sensory aspect of smoking than for the nicotine. Thus, it may be that men and women should receive different treatments.

Pregnant women: Because smoking can seriously harm a developing embryo or fetus, pregnant women are encouraged to quit as soon as pregnancy is determined. Pregnant smokers should first try to quit using counseling, behavioral interventions, and social support. If this is unsuccessful, drug therapy should be considered. As mentioned previously, nicotine replacement therapy and bupropion are potential treatment options under medical supervision. Further, other members of the family who smoke should be encouraged to do so outside the household environment, as secondhand tobacco smoke can interfere with fetal lung development.

Members of racial and ethnic minority groups: Although smoking and cessation patterns may vary among populations, smoking cessation treatments are effective across all racial and ethnic groups. Some research has suggested that some populations may respond differently
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than others to certain drug therapies. However there are no conclusive data to support prescribing different medications for people of different ethnic backgrounds. Nevertheless, smoking cessation programs and components such as educational materials and counseling should be tailored to an individual’s language and culture.

Hospitalized smokers: Hospitalized smokers, whether in long-term or short-term facilities, should be encouraged to stop smoking and provided with the necessary means to do so. Smoking can interfere with recovery and further compromise preexisting conditions. Because hospitals are now generally smoke-free, patients are already in an appropriate environment and should use this as a catalyst in attempting to quit.

Patients with preexisting psychiatric conditions and/or chemical dependency: Smoking cessation treatments can be effective in smokers with preexisting psychiatric conditions, such as depression, and those with chemical dependency problems such as alcohol abuse. Because bupropion and nortriptyline are antidepressants and are useful in treating smoking cessation, these drugs specifically are options for smokers who have a history of depression. Research shows that smokers with other chemical dependency problems can benefit from smoking cessation treatments. Treatment for smoking cessation does not seem to compromise treatment of other forms of chemical dependency.

Children and adolescents: The number of adolescent smokers has increased dramatically in the past decade, and the age at which young people try their first cigarette is decreasing. Adolescents often become addicted rapidly, and like adults, they may find it difficult to quit. There are currently no standard guidelines for treating tobacco dependence in children and adolescents. The same methods that are used for adults can also be used in adolescents, though some alterations may be necessary. Counseling and support are encouraged and should address many of the social and psychological issues involved with teen smoking. NRTs and bupropion can be used in adolescents under the supervision of a physician. Young prospective quitters should be aware that over the counter NRT products cannot be purchased legally by anyone under the age of 18, and that NRT products are subject to the same school rules that apply to other types of medication.

Older smokers: Smoking cessation interventions, including counseling, support groups, and NRT, have been shown to be effective in smokers
over the age of 50 and also in those over the age of 65.\textsuperscript{6} In older adults, just as in younger people, quitting can reduce the risk of heart attacks, coronary artery disease, and lung cancer and can help individuals recover more rapidly from illnesses that are exacerbated by smoking.

**SMOKELESS T OBACCO AND OTHER T OBACCO PRODUCTS**

Although tobacco dependence encompasses products other than cigarettes, the focus of this report is cigarette smoking cessation. There has been only limited research on the treatment of dependence on other tobacco products such as smokeless tobacco, cigars, and pipes. However, experts suggest that some of the same methods used for cigarette smoking cessation, specifically counseling, may be effective in helping users of these products quit.\textsuperscript{6}

**INSURANCE CO V E R AG E, ACCESS TO T R E AT M E N T, AND COST EFFECTIVENESS**

Smoking cessation treatment is not integrated into the general U.S. healthcare system at the present time. Few insurance companies and only some Medicaid and state health agencies reimburse for smoking cessation treatments.\textsuperscript{16,62} When coverage is provided, there may be qualifications and limitations — such as lifetime caps or time constraints — that may make it difficult to utilize services effectively. Some plans that do cover smoking cessation cover 50% of behavioral services and 100% of nicotine replacement therapy.\textsuperscript{63} Currently, 34 states provide some form of Medicaid coverage for tobacco dependence treatments for low-income smokers, while the remaining states do not.\textsuperscript{64} Many smokers live below the poverty line and have no healthcare coverage whatsoever, making it very difficult to gain access to treatment.

The United Kingdom recently announced that it would reimburse for nicotine replacement products under the National Health Service prescription and will also provide additional benefits for bupropion.\textsuperscript{65} Some think that offering more drug therapies over the counter will result in a higher utilization of these treatments and thus a higher success rate.\textsuperscript{66} Studies show that providing the nicotine patch over the counter doubles quit rates compared to placebo,\textsuperscript{6} and NRTs such as the patch and gum available over the counter have success rates comparable to when they are delivered via prescription.\textsuperscript{67} Most importantly,
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over the counter status increases the number of smokers who have access to the treatments and the likelihood that they will use the products.

According to healthcare professionals, smoking cessation treatment is the “gold standard” of preventive healthcare services.68 Given the substantial costs of smoking and its effects on health and healthcare costs, smoking cessation treatment should be encouraged and integrated into the healthcare system.

CONCLUSION

Stopping smoking is one of the most important and most challenging lifestyle changes an individual can make. Although the efficacy of smoking cessation methods and programs may appear limited, drug therapies and counseling/support do help many smokers quit. The more intense, the more persistent, and the more integrated the treatment, the greater the success rate. Smokers who participate in intensive therapies have higher quit rates, and the most important factor in achieving success is utilizing treatment and maintaining the motivation to make multiple quit attempts. Using some form of drug therapy can increase the chance of success by nearly 30%, and combining this treatment with counseling can nearly double that rate. Choosing a smoking cessation technique is a matter of individual needs, expectations, and resources, and no single method has been proven to work for everyone.

Considering the many health, social, and economic benefits of quitting — and the many treatments available — it is in a smoker’s best interest to attempt to quit. More than 45 million Americans have liberated themselves from smoking, so it is possible to quit — and quit for good.
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During the twenty first century the biggest megacity is still Tokyo. We use the 1 when we talk about something we’ve already mentioned. 2 when it’s clear what you’re referring to. Each team has three players and 8 ___ first team to score 21 wins. Usually introduced to sepak takraw at 9 ___ school, players have to be very fit and practise daily to achieve 10 ___ almost super-hero skills needed to win 11 ___ international matches. 9. Complete the text about the origin of the Olympic Games with a/an, the or an (no article). In the 19th century, economic inequalities were at their historic high, because despite unprecedented economic growth, wages stagnated and nearly all the profit went to the owners. Marx’s Communist Manifesto with its predictions of the inevitable fall of capitalism was born out of this reality. However, Marx’s prophecy never came to realize. It’s also difficult to define a twenty-first century cowboy. Surely it can’t be the big cattle owners who do business with a seventy-billion dollar beef industry? These modern ranches use the latest technology and employ accountants. And so cowboys ride on horses to bring them home. Cowboys work in the middle of nowhere, in a place where you can’t make a phone call because mobile phones don’t work. Like the cowboys of the past, twenty-first century cowboys still get up early on freezing cold mornings and make breakfast over an open fire. There is no Monday to Friday, weekends off or paid holidays. So why do men choose this life?