

Promoting Smoking Cessation

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Cigarette smoking causes significant morbidity and mortality in the United States. Physicians can use the five A's framework (ask, advise, assess, assist, arrange) to promote smoking cessation. All patients should be asked about tobacco use and assessed for motivation to quit at every clinical encounter. Physicians should strongly advise patients to quit smoking, and use motivational interviewing techniques for patients who are not yet willing to stop smoking. Clinical contacts with unmotivated patients should emphasize the rewards and relevance of quitting, as well as the risks of smoking and anticipated barriers to abstinence. These messages should be repeated at every opportunity. Appropriate patients should be offered pharmacologic assistance in quitting, such as nicotine replacement therapies, bupropion, and varenicline. Use of pharmacologic support during smoking cessation can double the rate of successful abstinence. Using more than one type of nicotine replacement therapy ("patch plus" method) and combining these therapies with bupropion provide additional benefit. However, special populations pose unique challenges in pharmacotherapy for smoking cessation. Nicotine replacement therapies increase the risk of birth defects and should not be used during pregnancy. They are usually safe in patients with cardiovascular conditions, except for those with unstable angina or within two weeks of a coronary event. Varenicline may increase the risk of coronary events. Nicotine replacement therapies are safe for use in adolescents; however, they are less effective than in adults. Physicians also should arrange to have repeated contact with smokers around their quit date to reinforce cessation messages. (*Am Fam Physician*. 2012;85(6):591-598. Copyright © 2012 American Academy of Family Physicians.)

► **Patient information:** A handout on smoking cessation, written by the authors of this article, is provided on page 599.

Cigarette smoking is a major modifiable health risk factor in the United States, significantly contributing to deaths from cancer and cardiovascular and pulmonary diseases. Although it is estimated that smoking-related illnesses lead to 443,000 premature deaths and almost \$100 billion in lost productivity each year,¹ one in five American adults still smokes regularly (22 percent of men, 17.5 percent of women).²

Smoking cessation is difficult, with the average smoker attempting to quit five times before permanent success. However, smoking cessation results in considerable health benefits.³ Primary care physicians have many opportunities to counsel patients about smoking cessation.^{4,5}

Five A's Counseling Strategy

Physicians should address smoking cessation with all patients who use tobacco.⁶ Although

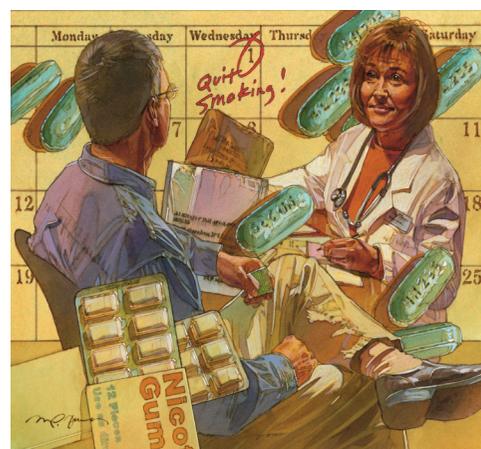


ILLUSTRATION BY MARK SCHULLER

intensive group and individual psychological counseling are effective in helping smokers achieve abstinence, most smokers are not interested in participating in these types of interventions.^{7,8} The five A's framework (ask, advise, assess, assist, arrange) has been developed to allow physicians to incorporate smoking cessation counseling into busy clinical practices.⁴ Table 1 describes the five A's framework for smoking cessation counseling.^{4,9-19}

ASK

Adding smoking status as a vital sign to all patients' charts increases the likelihood that physicians will address tobacco use as a risk behavior with smokers and provide them with cessation-related advice.²⁰

ADVISE

Even brief physician advice may prompt an additional 1 to 3 percent of patients to attempt cessation and improve quit rates

Table 1. Five A's Framework for Smoking Cessation

Component	Description	Comments
Ask	Office systems should ensure that all tobacco users are identified; smoking status should be documented at every visit	Promoting smoking cessation appears to increase patients' satisfaction with their visit, even among smokers not yet motivated to quit ⁹ Including smoking as a vital sign in patients' charts may remind the physician to address tobacco use <i>"Have you ever been a smoker or used other tobacco products? Do you use tobacco now? How much?"</i>
Advise	Unambiguous support for smoking cessation should be expressed by the physician, and the benefits of quitting should be discussed	Advice to patients should be clear (direct expression of the need for smoking cessation), strong (highlighting the importance of cessation), and personalized (linking the patient's health goals to cessation) ⁴ Setting a follow-up appointment specifically to discuss this advice further may increase the patient's uptake of the advice ¹⁰ <i>"I think quitting smoking is very important for you because of your asthma. I want you to come back to the office next week so we can talk about this more."</i>
Assess	Willingness to quit and barriers to quitting should be assessed, as well as smoking history and current level of nicotine dependence; patients should be asked about their timeline for quitting and about previous attempts	<i>"Have you ever tried to cut back on or quit smoking? Are you willing to quit smoking now? What keeps you from quitting? How soon after getting up in the morning do you smoke?"</i>
Assist (or refer)	Offer support and additional resources (e.g., referral to counseling, http://www.smokefree.gov , 1-800-QUIT-NOW, pharmacotherapy); help patients to anticipate difficulties and encourage them to prepare their social support systems and their environment for the impending change Withdrawal: Common nicotine withdrawal symptoms (e.g., irritability, anxiety, restlessness) peak within the first week of abstinence and last two to four weeks; NRTs can be helpful because they gradually decrease nicotine dependence; smokers should also be advised to decrease caffeine intake* Depression: Smokers are more likely than nonsmokers to have a depressive episode, ¹² and smokers with depression are less likely to successfully quit ¹³ ; smoking cessation may trigger depression in those with a history of depression ¹⁴ ; physicians should consider monitoring the mood of smokers during quit attempts and screen for depression in those who have repeatedly been unable to quit; bupropion (Zyban) may be an appropriate cessation aid for smokers at risk of depressive relapse Weight gain: Although most smokers gain fewer than 10 lb (4.5 kg) after quitting, weight gain can vary (10 percent will gain 30 lb [13.5 kg]) ¹⁵ ; although this weight gain poses less health risk than smoking, concern about weight gain may interfere with the quit attempt; sustained-release bupropion or an NRT (particularly gum or lozenges) may be helpful in these patients because they delay weight gain while in use ⁴ ; it may be easier to monitor and adjust food intake/exercise balance after immediate tobacco cravings are no longer as prominent	Although some patients choose to cut back on smoking before their quit date, abrupt change is no less effective than gradual change in producing long-term abstinence. ¹¹ <i>"I would like to help you quit. Can I tell you about some of the things we know can increase your odds of success?"</i> <i>"Are you worried about anything in particular when it comes to quitting? Do you worry about cravings or weight gain?"</i>
Arrange	Follow-up plans should be set; for patients who have recently quit, it is important to elicit the benefits of quitting and ask patients to anticipate and problem solve about situations that might lead to relapse; follow-up contacts should also be used to readjust the dosages of therapeutic agents that may be altered by smoking cessation (e.g., beta blockers, antipsychotics, insulin, benzodiazepines)*	Abstinence by the quit date is highly predictive of long-term success ¹⁶ <i>"I would like to see you in the office (or talk to you by phone) on your quit date."</i> <i>"What problems have you had? Are there situations you worry about confronting without cigarettes?"</i>

NRT = nicotine replacement therapy.

*—The polycyclic aromatic hydrocarbons found in tobacco smoke are potent inducers of cytochrome P450. Persons who have recently quit smoking are likely to have increased concentrations of substances that are metabolized by the cytochrome P450 system.^{4,17,18} For example, former smokers may experience markedly increased plasma caffeine levels with continued use of the same amount of caffeine used before smoking cessation.¹⁹

Information from references 4, and 9 through 19.

Table 2. Stages of Behavior Change

Stage	Description	Comments
Precontemplation	No intention to take action within the foreseeable future (next six months)	Possibly unaware of the need to change; may overestimate the costs of change and underestimate the benefits; consider reluctance (does not want to consider change, inertia), rebellion (does not like being told what to do), resignation (overwhelmed and demoralized by the idea of change), rationalization (understands the consequences of the behavior, but denies that they apply to him or herself)
Contemplation	Considering change within the next six months	Ambivalent about change; perceives that costs equal benefits
Preparation	Planning to take action within the next month	May have already made steps toward change; often concerned about failure
Action	Actively changing (first six months of new behavior)	Needs vigilance to prevent relapse and encouragement to keep up the momentum
Maintenance	More than six months since behavior change	May benefit from reminders about high-risk situations

Information from reference 23.

Table 3. Five R's Strategy for Motivating Patients to Quit Smoking

Component	Description	Examples
Relevance	Encourage the patient to identify reasons to stop smoking that are personally relevant	Pregnancy, personal or family risk of disease, person in the household with asthma
Risks	Advise the patient of the harmful effects of continued smoking, both to the patient and to others, incorporating aspects of the personal and family history whenever possible	Effects on the patient and the patient's family, friends, and coworkers; measuring "lung age"* through spirometry can help personalize risk ²⁶
Rewards	Ask the patient to identify the benefits of smoking cessation	Improved health, financial savings from not buying cigarettes, decreased cigarette odor
Roadblocks	Explore the barriers to cessation that the patient may encounter	Presence of other smokers in the home or workplace, history of failed quit attempts or severe withdrawal symptoms, stress, psychiatric comorbidity, low motivation, weight gain, enjoyment of smoking
Repeat	Include aspects of the five R's in each clinical contact with unmotivated smokers	—

*—The age at which a healthy nonsmoker would perform similarly on spirometry.

Information from references 4 and 26.

compared with patients who receive no advice (relative risk = 1.7).²¹

ASSESS

Patients' motivation to quit smoking should be assessed at every visit. Patients not yet willing to quit should receive a motivational intervention.^{4,20,22}

Behavior change can be conceptualized into five progressive stages: precontemplation, contemplation, preparation, action, and maintenance (*Table 2*).²³ Although tailoring interventions to a patient's stage of change may not be necessary,²⁴ these stages emphasize that not all patients are equally motivated to quit smoking, motivation is malleable, and patients can be assisted toward behavior change through physician intervention.

Confrontational interactions with patients ambivalent

about behavior change are ineffective. Motivational interventions, by contrast, explore a patient's ambivalence to smoking cessation in an empathetic, questioning manner, which respects the patient's autonomy and builds self-efficacy.²² Motivational interventions, especially those in which physicians take a central role in the counseling, are more effective than brief advice and usual care in promoting smoking cessation.²⁵ The Agency for Healthcare Research and Quality has identified several components of discussion to enhance patients' motivation to stop smoking. These components are the five R's (relevance, risks, rewards, roadblocks, repeat; *Table 3*).^{4,26}

ASSIST (OR REFER)

Asking patients who are willing to quit to set a quit date can prompt change, and physicians should help patients

Table 4. First-Line Therapies for Smoking Cessation in Adults

Therapy	Dosage	Comments	Cost*
Nicotine gum† (Nicorette)	Available in 2-mg and 4-mg (per piece) doses Patients smoking less than 25 cigarettes per day: 2 mg Patients smoking 25 or more cigarettes per day: 4 mg Maximum dosage: 24 pieces per day	Over the counter Intermittently chew, then “park” between gum and cheek for maximum benefit; eating or drinking acidic foods or beverages within 30 minutes of use decreases effectiveness; may delay weight gain; difficult to use with dentures, partials, or fillings FDA pregnancy category C Side effects: Gastrointestinal distress; mouth or throat irritation	\$40 (\$52) for 100 pieces
Nicotine inhaler† (Nicotrol)	One dose consists of one inhalation Recommended dosage is six to 16 cartridges per day; each cartridge delivers 4 mg of nicotine over 80 inhalations	Prescription Eating or drinking acidic foods or beverages within 30 minutes of use decreases effectiveness FDA pregnancy category D Side effects: Mouth or throat irritation (40 percent), coughing (32 percent), rhinitis (23 percent)	NA (\$213) for 168 10-mg cartridges
Nicotine lozenge† (Nicorette)	Heavy smokers: 4 mg Light smokers: 2 mg Maximum: 20 lozenges per day	Over the counter May delay weight gain; should be taken one at a time and dissolved in the mouth, not chewed or swallowed; eating or drinking acidic foods or beverages within 30 minutes of use decreases effectiveness; contains 25 percent more nicotine than gum FDA pregnancy category D Side effects: Nausea, heartburn, headache	\$47 (\$58) for 108 lozenges
Nicotine patch† (Nicoderm CQ [24-hour patch], Nicotrol [16-hour patch; not available in the United States])	Doses vary and should be tapered as therapy progresses Heavy smokers: 21 mg per day (initial dosage) Light smokers or those weighing less than 100 lb (45 kg): 10 to 14 mg per day (initial dosage)	Over the counter Treatment of up to eight weeks has been shown to be as effective as longer treatments; site of patch should be changed daily; 16- and 24-hour patches have comparable effectiveness; adolescents may require lower starting dosages because of body habitus and overall smoking patterns (e.g., less than one-half pack per day) FDA pregnancy category D Side effects: Skin reactions (up to 50 percent), headaches, insomnia (decreased if patient removes patch at night)	24-hour patch: \$32 (\$54) for 14 patches
Nasal spray† (Nicotrol NS)	One dose consists of two 0.5-mg sprays (one in each nostril) Initial dosage is one or two doses per hour (minimum of eight doses per day), increasing as needed for symptom relief Maximum: 40 doses per day (five doses per hour)	Prescription Dependence potential is intermediate between other nicotine replacement therapies and cigarettes FDA pregnancy category D Side effects: Moderate to severe nasal irritation within the first two days (94 percent) that often continues throughout use	NA (\$207) for 40 mL

continued

anticipate obstacles to cessation. Nicotine withdrawal symptoms, depression, and weight gain are specific areas in which patients may benefit from clinical guidance.⁴

ARRANGE FOR FOLLOW-UP

Patients should be contacted around the time of their quit date to be congratulated on their (presumed) abstinence. Contacting patients at least four more times to support their smoking-cessation attempts increases abstinence rates.⁴

Patients who are unable to quit or who relapse should be reassessed. Pharmacologic therapies and additional behavioral counseling should be considered, and patients should be encouraged to set a new quit date.^{4,27-29}

Medications

Pharmacologic therapies to assist tobacco cessation substitute the source of nicotine or mimic its function (Table 4).^{4,30} Bupropion (Zyban) is thought to block access to nicotine receptors, but this is unproven.

Table 4. First-Line Therapies for Smoking Cessation in Adults (continued)

Therapy	Dosage	Comments	Cost*
Bupropion, sustained release (Zyban)	150 mg in the morning for three days, then increased to 150 mg twice per day Begin therapy one to two weeks before the quit date, continue until 12 weeks to six months after the quit date	Prescription Can be combined with a nicotine replacement therapy for increased effectiveness; may be beneficial for patients with a history of depression; insufficient evidence to be a first-line therapy for adolescents FDA pregnancy category C Side effects: Insomnia (35 to 40 percent), dry mouth (10 percent) Contraindicated in persons with a history of seizure disorder or an eating disorder, and in those who have used a monoamine oxidase inhibitor in the past 14 days FDA boxed warning: May increase suicidality in patients with depression	\$106 (\$210) for 60 tablets
Varenicline (Chantix)	Days 1 to 3: 0.5 mg once per day Days 4 to 7: 0.5 mg twice per day Day 8 to end of treatment: 1 mg twice per day Begin therapy one week before quit date and continue for 12 weeks; an additional 12 weeks can be added if quit attempt is successful to increase chances of long-term abstinence	Prescription Should not be combined with a nicotine replacement therapy; the safety of combining varenicline and bupropion has not been established; insufficient evidence to be a first-line therapy for adolescents FDA pregnancy category C Side effects: Headache, nausea (dose related), insomnia, abnormal dreams, flatulence Increased risk of cardiovascular events in smokers with cardiovascular disease should be discussed with patients ³⁰ FDA boxed warning: May cause serious neuropsychiatric symptoms in patients, including changes in behavior, hostility, agitation, depressed mood, suicidal thoughts and behavior, and attempted suicide; patient should be monitored closely	NA (\$191) for 60 tablets

FDA = U.S. Food and Drug Administration; NA = not available.

*—Estimated retail price based on information obtained at <http://www.drugstore.com> (accessed December 6, 2011). Generic prices listed first, brand prices listed in parentheses.

†—Nicotine replacement therapies should be used with caution in the immediate (within two weeks) postmyocardial infarction period, in patients with serious cardiac arrhythmias, and in patients with serious or worsening angina pectoris.

Information from references 4 and 30.

NICOTINE REPLACEMENT THERAPIES

The goal of nicotine replacement therapies (NRTs) is to relieve cravings for nicotine and reduce nicotine withdrawal symptoms. NRTs are available as slow-release skin patches and in more rapidly acting forms (i.e., chewing gum, nasal spray, inhalers, and lozenges), which deliver nicotine to the brain more quickly than skin patches but more slowly than smoking cigarettes. A Cochrane review of 132 trials concluded that all forms of NRTs increase the chances of quitting successfully by 50 to 70 percent.²⁷

Heavy smokers should be encouraged to use higher dosages of an NRT or try a “patch plus” method, using the nicotine patch to provide a base level of slowly delivered nicotine and adding a more rapidly acting NRT to control breakthrough cravings. This regimen is safe because smokers typically obtain less nicotine than through smoking, and it is more effective than using a single NRT.⁴

NICOTINIC RECEPTOR AGONIST

Varenicline (Chantix) is a selective alpha₄-beta₂ nicotinic receptor partial agonist that reduces cravings and withdrawal symptoms while blocking the binding of smoked nicotine.²⁸ Varenicline increases the chances of a successful quit attempt two- to threefold compared with no pharmacologic assistance.³¹ In a direct comparison, varenicline was superior to bupropion in promoting abstinence.³² However, new data suggest increased risk of coronary events with varenicline.³⁰

BUPROPION

Initially developed as an antidepressant, bupropion has

Women who quit smoking before pregnancy or in early pregnancy significantly reduce the risk of preterm birth, low birth weight, and infant mortality.

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been shown to be effective as a smoking cessation aid. A Cochrane review of 19 randomized trials showed that bupropion doubles the odds of smoking cessation compared with placebo.²⁹

SECOND-LINE THERAPIES

Clonidine (Catapres) and nortriptyline (Pamelor) also have demonstrated effectiveness in clinical trials for smoking cessation,⁴ and they may be used if first-line medications are contraindicated or ineffective. Other complementary and alternative therapies are summarized in Table 5.^{4,33-39}

Special Populations

PREGNANT WOMEN

Tobacco is a known carcinogen that can harm a developing fetus. Women who quit smoking before pregnancy or in early pregnancy significantly reduce the risk of adverse outcomes, including preterm birth, low birth weight, and infant mortality. However, smoking cessation therapies also carry risks in pregnant women. Using NRTs during the early stages of pregnancy may increase the risk of birth defects, according to a study of 77,000 pregnant Danish women.⁴⁰

Other pharmacologic aids have not been tested for safety and effectiveness in treating tobacco dependence in pregnant women. Therefore, pregnant smokers should

SORT: KEY RECOMMENDATIONS FOR PRACTICE

<i>Clinical recommendation</i>	<i>Evidence rating</i>	<i>References</i>
All adults should be screened routinely for tobacco use.	A	6
All smokers should be encouraged to quit at every clinical contact.	A	4, 20
Motivational interventions should be used with patients who are not yet ready to quit smoking.	A	4, 25
Physicians should encourage appropriate patients to use effective medications for treatment of tobacco dependence to improve quit rates.	A	4, 27-29
Heavy smokers should be encouraged to use higher dosages of a nicotine replacement therapy, or more than one form ("patch plus" regimen).	B	4
Pregnant smokers should be offered person-to-person psychosocial interventions that exceed minimal advice to quit.	B	4
Sustained-release bupropion (Zyban) or a nicotine replacement therapy (particularly gum and lozenges) may be more appropriate for smokers who are concerned about weight gain after quitting.	C	4

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to <http://www.aafp.org/afpsort.xml>.

be offered intensive person-to-person interventions that exceed minimal advice to quit, such as behavioral support and problem solving, counseling, and referral to support organizations.⁴

PERSONS WITH CORONARY HEART DISEASE

Smoking cessation substantially reduces the risk of coronary heart disease. The success rate of bupropion in patients with established cardiovascular disease is similar to that in healthy smokers,⁴¹ and the drug is

Table 5. Complementary and Alternative Therapies to Assist in Smoking Cessation

<i>Therapy</i>	<i>Comments</i>
Acupuncture	Acupuncture, acupressure, laser acupuncture, and electroacupuncture all have been proposed as cures for nicotine addiction or as a means to reduce withdrawal symptoms A Cochrane review did not find consistent evidence that these therapies are more beneficial for smoking cessation than no treatment or sham acupuncture ³³
Exercise	Small, heterogeneous studies provide little evidence that exercise improves quit rates ³⁴ ; however, it may be useful to promote weight control after smoking cessation ³⁵
Hypnotherapy	A Cochrane review found a lack of evidence that hypnotherapy is beneficial compared with other therapies or no treatment ³⁶
Internet-based interventions (e.g., http://www.smokefree.gov)	A Cochrane review of 20 randomized and quasi-randomized studies did not find conclusive evidence of benefit, especially at long-term follow-up ³⁷ ; Web sites providing personally tailored information and repeated automated contacts may be beneficial as an adjunct to other cessation strategies ⁴
Telephone quitlines (e.g., 800-QUIT-NOW)	Physician encouragement to use quitlines has a two to three times greater effect on smoking cessation than counseling alone in the primary care setting ³⁸ ; the use of quitlines results in a relative risk of cessation of 1.37 ³⁹

Information from references 4, and 33 through 39.

recommended for smoking cessation in patients with cardiovascular disease. However, bupropion is cardiotoxic in overdose and should be considered as a cause of unexplained widening of the QRS complex on electrocardiography.⁴²

Although varenicline improves one-year abstinence rates over placebo in smokers with cardiovascular disease, the U.S. Food and Drug Administration recently released a warning about a possible increase in cardiovascular risk with the drug. Although uncommon, increased rates of angina pectoris, nonfatal myocardial infarction, need for coronary revascularization, and peripheral vascular disease have been reported in patients taking varenicline.³⁰

Data indicate that the benefits of NRTs for smoking cessation outweigh the risks of the therapies. However, NRTs may have the potential to trigger cardiac events in the immediate postmyocardial infarction period, in patients with serious cardiac arrhythmias, and in patients with serious or worsening angina pectoris.⁴³ Physicians may consider a lower initial dosage, more frequent monitoring of side effects, and alternative therapies, such as behavioral interventions.

ADOLESCENTS

Ninety percent of adult smokers began smoking as adolescents or preadolescents.⁴⁴ The U.S. Preventive Services Task Force found insufficient evidence to recommend tobacco screening or interventions in adolescents⁴⁵; however, physicians may intervene with adolescent smokers using motivation-enhancing strategies such as the five A's and the five R's.⁴ Although considered safe for adolescents,⁴⁶ NRTs may require more intensive instruction and lead to lower tobacco abstinence rates than in adults.

Data Sources: The following databases were searched: Essential Evidence Plus, PubMed, Cochrane Database of Systematic Reviews, National Guidelines Clearinghouse, U.S. Preventive Services Task Force, Dynamed, PEPID, and UpToDate. The search included meta-analyses, randomized controlled trials, clinical trials, guidelines, and reviews. The key term smoking cessation was searched with the other key terms interventions, therapies, medications, nicotine replacement, pregnancy, alternative, complementary, CAM, cardiovascular disease, and adolescents. Search dates: December 6, 2010, to March 1, 2011.

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