

# Smoking Cessation in Primary Care

## EVIDENCE REVIEW

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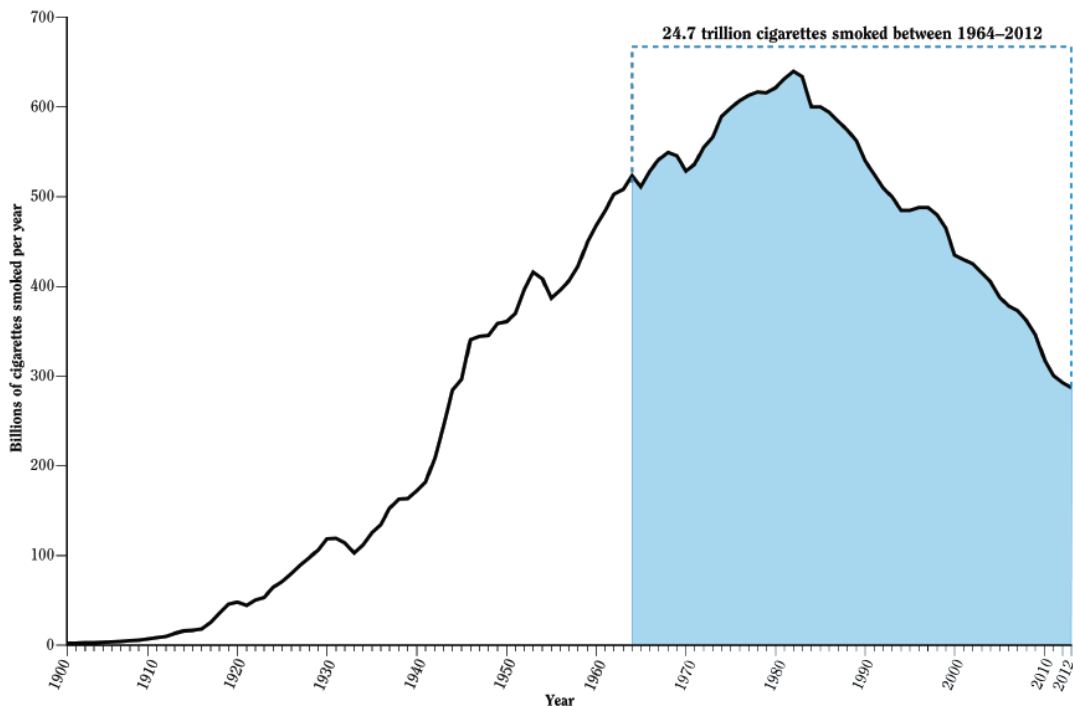
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# Encouraging Smoking Cessation in Primary Care

## Scope of the problem

Although smoking prevalence has declined significantly over the past 50 years (Figure 1), smoking remains the leading cause of preventable, premature mortality in the United States.<sup>2</sup> Because cigarettes have become highly-engineered products containing many compounds in addition to tobacco, today's cigarette smokers have a much higher risk for lung cancer and chronic obstructive pulmonary disease (COPD) than smokers in 1964, despite smoking fewer cigarettes.<sup>2</sup> The Surgeon General's 2014 report asserts that the current rate of progress in tobacco control is not fast enough, and that much more needs to be done to end the tobacco epidemic. If smoking persists at the current rate among young adults in this country, for example, 5.6 million of today's Americans younger than 18 years of age are projected to die prematurely from a smoking-related illness.<sup>2</sup>

**Figure 1. Total cigarette consumption, United States, 1900-2012**



Source: Miller 1981; U.S. Department of Agriculture 1987, 1996, 2005, 2007a,b; Centers for Disease Control and Prevention 2012.

The overall decline in smoking prevalence masks significant disparities based on race, geography, and socio-economic status. Oklahoma, for example, has consistently had one of the highest rates of adult smoking in the country; an estimated 23.3% of Oklahoma adults smoked in 2012, compared to the national rate of 19.6%.<sup>6,7</sup> Total cigarette sales in Oklahoma have remained

stable recently (about 71 packs per capita, each year from 2010 through 2012), but have declined from 86.7 packs per capita in 2008.<sup>8</sup>

Recent patterns in smoking-related morbidity and mortality by gender have shifted. For the first time ever, women who smoke are now as likely to die from lung cancer as men are.<sup>2</sup> Female smokers 35 years of age and older are more likely to die from coronary heart disease than male smokers.<sup>2</sup>

### Other forms of tobacco use

Although most tobacco-related morbidity and mortality comes from cigarettes, other forms of tobacco use are also harmful. Unlike the trend in cigarette smoking, the percentage of people using these forms of tobacco has remained steady in the past decade or even risen slightly (Table 1, Figure 2).

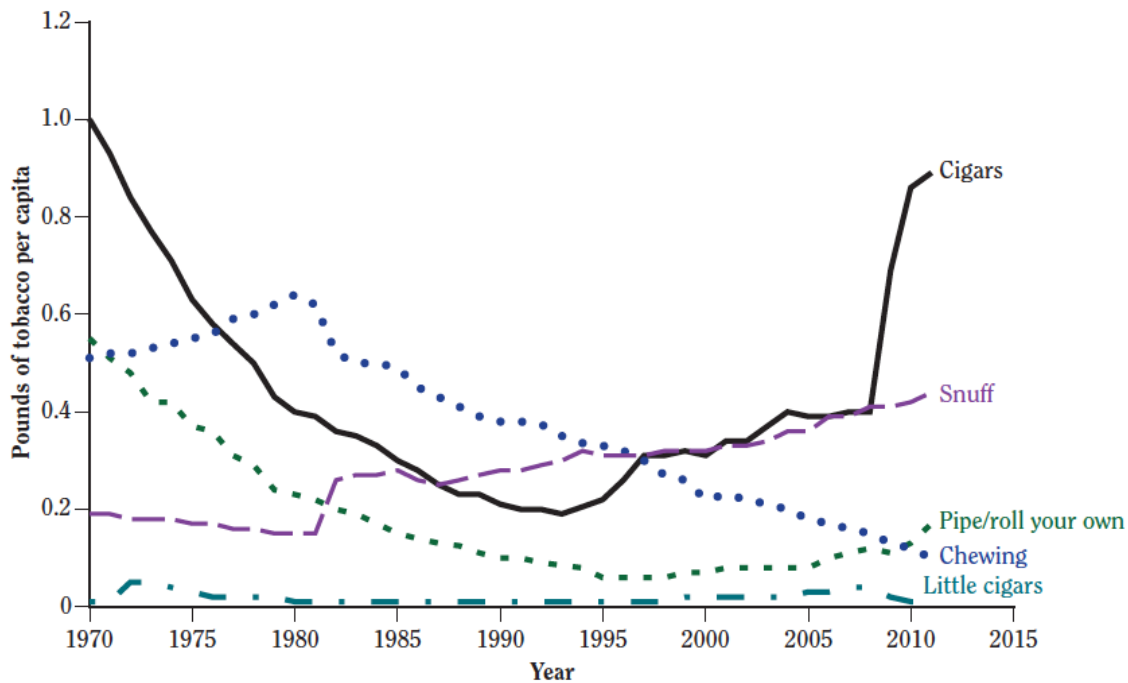
**Table 1. Percentage of adults (18+) using tobacco product in the past month, 2002-2012.<sup>12</sup>**

Form of tobacco	2002	2012
Cigarettes	25.8%	22.0%
Smokeless tobacco	3.5%	3.6%
Cigars	5.5%	5.4%
Pipe tobacco	0.8%	1.0%

Compared with cigarette smokers, people who smoke pipes or cigars exclusively have a lower, but still significant, risk for many smoking-related diseases.<sup>13</sup> Smoke from pipes and cigars contains the same toxic substances as cigarette smoke, but pipe or cigar smokers usually smoke less frequently and inhale less often, thus reducing their exposure. Former cigarette smokers who switched to a pipe or cigar, however, are more likely to report inhaling the smoke into their lungs than were pipe or cigar smokers who had not smoked cigarettes previously. These former cigarette smokers had higher biochemical measures of exposure when smoking other tobacco products.<sup>14</sup>

In recent years, both the sale and consumption of cigars has increased, and data indicate that the dual use of cigars and cigarettes is rising, suggesting the potential for increased adverse health effects from cigars.<sup>15</sup>

Figure 2. Per capita consumption of non-cigarette products in the U.S., 1970-2011.<sup>2</sup>



Smokeless tobacco products, primarily snuff and chewing tobacco, are associated with many health problems including nicotine addiction; cancers of the mouth, esophagus, and pancreas, increased risks for early delivery and stillbirth when used during pregnancy; and increased risk for death from heart disease and stroke.<sup>16</sup>

### The rise of e-cigarettes

The advent of electronic cigarettes (e-cigarettes) is providing a new and potentially dangerous way for young people to become addicted to nicotine. These products deliver a nicotine-containing aerosol (commonly called vapor) by heating a solution typically made up of propylene glycol or glycerol (glycerin), nicotine, and flavoring agents. Use of e-cigarettes has grown rapidly despite many unanswered questions about their overall safety, their theoretical potential for harm reduction relative to tobacco cigarettes, or even their efficacy in smoking cessation. The Centers for Disease Control and Prevention reported that between 2011 and 2013 the number of U.S. middle and high school students who had never smoked regular cigarettes but who began smoking e-cigarettes tripled, from 79,000 in 2011 to 263,000 in 2013.<sup>17</sup> A recent longitudinal study of adolescents and young adults found that e-cigarette users were more likely to become smokers after 1 year of follow-up than those not using e-cigarettes, and e-cigarette users were more likely to report being open to smoking.<sup>18</sup>

E-cigarettes pose a moving target for researchers because the technologies used are changing quickly. Many of the findings from studies of older products may not be relevant to the assessment of newer products that could be safer and more effective as nicotine delivery devices.<sup>19</sup> To date, only a few small studies have directly investigated the health effects of exposure to e-cigarette aerosol, and these studies are limited. Some of these demonstrated harmful biological effects from e-cigarette exposure, such as increased airway resistance and exposure to some toxic substances.<sup>19</sup> Long-term biological effects are unknown at this time

because e-cigarettes have not been in widespread use long enough for assessment. The U.S. Food & Drug Administration has issued a proposed rule that would extend the agency's authority to regulate e-cigarettes, but no such action has been taken as of October 2015.<sup>20</sup>

A recent review of 4 clinical trials, 4 longitudinal studies, and 1 cross-sectional study examining the use of e-cigarettes as aids to smoking cessation concluded that e-cigarettes are not associated with successful quitting in population-based samples of smokers.<sup>19</sup> The authors note many limitations of current data, however, and call for larger and more rigorous studies to strengthen the evidence base.

## Call to action

Smoking remains the leading preventable cause of premature disease and death in the United States.<sup>2</sup> Primary care physicians are uniquely positioned to help their patients who smoke. This document summarizes proven methods for assessing patients' tobacco use and for supporting their efforts to quit. It also reviews evidence-based smoking cessation options that can significantly improve a person's chances for remaining abstinent once they quit. Many patients want to quit smoking, and physicians can nudge others along the stages of behavior change to contemplate quitting.

## Helping patients quit: effective strategies for busy clinicians

Primary care physicians can make a real difference in helping their patients quit smoking. The US Preventive Services Task Force recommends assessing whether patients are smoking and counseling smokers to quit at every visit.<sup>21</sup> Even brief physician advice may prompt an additional 1 to 3 percent of patients to attempt cessation and can improve quit rates compared with patients who receive no advice.<sup>22</sup> The five A's framework has been developed to allow physicians to incorporate smoking cessation counseling (for both adults and adolescents) into busy clinical practices.<sup>1</sup>

- **Ask:** identify tobacco use at every visit; electronic systems that prompt clinicians to ask about smoking for every patient at every clinic visit may be especially helpful.  
*Sample dialogue: "Have you ever been a smoker or used other tobacco products? Do you use tobacco now? How much?"<sup>23</sup>*
- **Advise:** strongly urge all tobacco users to quit, using a clear, strong, and personalized message.  
*Sample dialogue: "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."<sup>23</sup>*
- **Assess:** determine the patient's willingness to make a quit attempt.  
*Sample dialogue: "Have you ever tried to cut back on or quit smoking? Are you willing to quit smoking now? What keeps you from quitting?"<sup>23</sup>*
- **Assist:** help the patient with a quit plan, provide practical counseling, help the patient obtain social support, recommend use of medications as appropriate, and provide supplementary materials.  
*Sample dialogue: "I'd like to help you quit. Have you been successful with quitting previously for any length of time, and what helped you do so? Can I tell you about*



*some of the things we know can increase your odds of success? Are you worried about anything in particular when it comes to quitting? Do you worry about cravings or weight gain?*<sup>23</sup>

- **Arrange:** schedule follow-up contact, either in person or by telephone  
*Sample dialogue: "I would like to see you in the office (or talk to you by phone) on your quit date." "What problems have you had? Are there situations you worry about confronting without cigarettes? Do you have a plan for how to address your cravings for cigarettes during those situations?"*

One conceptual model places patients who smoke at one of several stages of tobacco cessation:<sup>24</sup>

- Pre-contemplative: not ready to make a commitment to quitting
- Contemplative: considering quitting in the near future
- Determination: ready now, may be planning a quit date themselves
- Action: actively engaged in quitting
- Maintenance: have quit, but are at risk of relapse

If patients are in the pre-contemplative stage, physicians may have less success when counseling smoking cessation. However, it remains important to review the 5 "Rs" with them:

- **Relevance:** point out the effects of smoking on their *own* health: e.g., if they had an MI, make sure they know smoking makes another more likely
- **Risks:** use their spirometry results to point out COPD if it is present; use a family history of lung cancer to emphasize their own increased risk
- **Rewards:** note the health benefits of quitting as well as the money saved on tobacco or health insurance plans
- **Roadblocks:** identify psychosocial stressors that drive smoking (e.g., depression)
- **Repetition:** keep reminding them of potential motivators for them to quit

### **Short- and long-term benefits of quitting, regardless of age**

- After 20 minutes of quitting: heart rate and blood pressure drop<sup>4</sup>
- After 12 hours: serum carbon monoxide level normalizes<sup>2</sup>
- 2-3 weeks after quitting: circulation improves and pulmonary function increases<sup>2</sup>
- 1-9 months after quitting: coughing and shortness of breath decrease, cilia function normalizes<sup>2</sup>
- 1 year after quitting: excess risk of coronary heart disease is half that of a continuing smoker<sup>2</sup>
- 5 years after quitting: risk of cancer of the mouth, throat, esophagus, and bladder are cut in half. Cervical cancer risk falls to that of a non-smoker. Stroke risk can fall to that of a non-smoker after 2-5 years.<sup>9</sup>
- 10 years after quitting: risk of dying from lung cancer is about half that of a continuing smoker.<sup>10</sup>
- 15 years after quitting: risk of coronary heart disease is same as a non-smoker's.<sup>11</sup>

## Counseling strategies for smoking cessation

For patients ready to make a commitment to quitting, the plan to assist them should contain both behavioral interventions and recommendations regarding pharmacologic therapy. A comprehensive approach to cessation is more successful than any one mode of therapy. A successful tobacco cessation program might include the following:<sup>25</sup>

- Social support: presence of family/friends to enable the plan and identify social barriers that may hinder success (e.g., a smoking spouse)
- Problem solving techniques: advise patients to anticipate smoking triggers, such as settings that often involve smoking; develop an outlet for anxiety while quitting, such as an exercise program or gum chewing
- Screen for psychiatric disease: smoking is more common in patients with depression, schizophrenia, and alcohol abuse; often smoking cessation is improved with treatment of these problems
- Recommend pharmacologic treatment (see below)
- Set a quit date: preferably within a few weeks of the provider encounter
- See this link for further details: [www.lung.org/about-us/lung-helpline.html](http://www.lung.org/about-us/lung-helpline.html)

Even providing brief advice about quitting smoking increases the likelihood that smokers will successfully quit and continue to abstain for 12 months.<sup>22</sup>

Focused counseling sessions between provider and patient can have substantial effects, and can increase tobacco cessation success by up to 20%.<sup>25</sup> While there are no clear counseling components critical to a successful program, the number of sessions is likely important. Impact was greatest with 4 sessions of at least 10 minutes in length.<sup>25</sup> Phone follow-up by a non-MD provider is very useful as well.<sup>26</sup>

## Medications to help with quitting

Good evidence suggests that the following pharmacotherapies can effectively support smoking cessation, unless contraindications are present:<sup>27</sup>

- Nicotine replacement therapy (gum, lozenges, transdermal patches, inhalers, and nasal spray)
- Bupropion (a norepinephrine/dopamine reuptake inhibitor and nicotinic acetylcholine receptor antagonist)
- Varenicline (a partial agonist of the alpha-4/beta-2 nicotinic acetylcholine receptor)

Although varenicline (Chantix) was found to be marginally superior to bupropion (Zyban, Voxra, others) in some studies,<sup>28</sup> little evidence supports

### Use Quitlines

Quitlines are telephone-based services that help tobacco users quit by providing them with counseling, practical information, referral to other cessation resources, and, in some states and for certain populations, FDA-approved cessation medications. Quitlines potentially have broad reach, are effective with diverse populations, and increase quit rates.<sup>1</sup>

State quitlines, such as Oklahoma's [Tobacco Helpline](#), can provide accessible cessation resources and can efficiently reach large numbers of smokers. In addition, quitlines are effective in reaching certain racial/ethnic populations, including smokers who are African American, predominantly speak Asian languages, and are low-income.<sup>3</sup>

Quitlines are highly cost-effective relative to other commonly-used disease prevention interventions.<sup>1,5</sup>

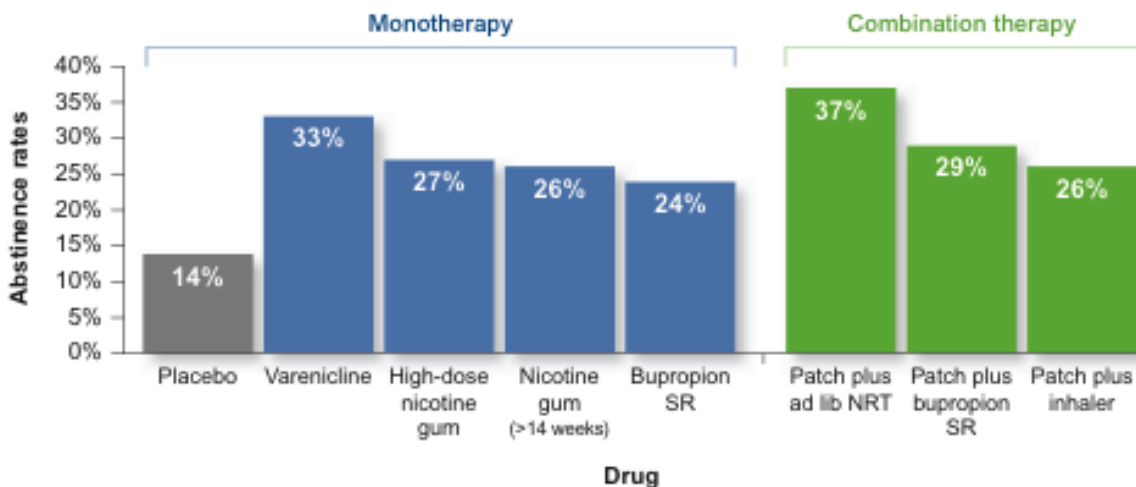
Technologies, such as text messaging, and social media platforms, could potentially extend the reach and increase the impact of quitlines.

choosing one of these agents over the other; each drug has a success rate of 15-25%.<sup>29,30</sup> Choose therapy based on patient preference, cost, and the presence of any mitigating medical and/or psychiatric conditions.

Some points to consider for each therapy:

- Nicotine Replacement Therapy<sup>31-33</sup>
  - Aimed at treating the symptoms of nicotine withdrawal: anxiety, irritability, insomnia, increased appetite and weight gain, decreased concentration, and depressed mood
  - Cessation rates are higher with long-acting nicotine release formulations (i.e., the transdermal patch) used in combination with a quick release product (gum, lozenge, inhaler) for acute nicotine cravings than for only one type of NRT
  - No evidence of increased cardiovascular events with use after myocardial infarction
- Bupropion<sup>34-36</sup>
  - Effects take at least 5-7 days to manifest, thus set a quit date 1-2 weeks after starting therapy
  - May be helpful for post-cessation weight gain<sup>37</sup>
  - Theoretically beneficial in patients with co-morbid depression or schizophrenia, but can make bipolar disease (mania) worse
  - Increased risk of seizure; avoid or use with extreme caution in patients at increased risk of seizure
  - Not found to be effective when studied in patients discharged after myocardial infarction<sup>38</sup>
- Varenicline
  - Marginally superior to bupropion; in one recent study had similar efficacy to nicotine patches and combination nicotine replacement therapies<sup>28,39</sup>
  - Can produce psychiatric symptoms (e.g., depression, agitation) and increase the risk of suicidal ideation<sup>40</sup>
  - Based on current data, varenicline is likely safe in the post-myocardial infarction setting, but caution is still advised in patients at highest risk with active cardiovascular disease<sup>41</sup>

**Figure 3: Abstinence rates at 1 year for medications used in smoking cessation<sup>42</sup>**



\*Placebo = counseling only; NRT = nicotine replacement therapy; Patch = nicotine patch



## Medications for smoking cessation<sup>23,43</sup>

Therapy	Dosage	Comments	Cost*
<b>Nicotine gum (Nicorette)</b>	2 mg pieces for lighter smokers and 4 mg for smokers using $\geq 25$ cigarettes per day. Max dosage: 24 4 mg pieces/day	OTC "Chew and park" method of moistening and putting inside lip is recommended to maximize absorption and decrease GI distress  Side effects: GI distress; mouth or throat irritation	\$22 - \$60 (depending on dose and number of pieces in package)
<b>Nicotine inhaler (Nicotrol)</b>	Recommended dosage is 6-18 cartridges/day; each cartridge delivers 10 mg nicotine	Eating or drinking acidic foods or beverages within 30 min. of use reduces effectiveness  Side effects: mouth or throat irritation, coughing, rhinitis	\$276 - \$301  (168 10 mg. cartridges)
<b>Nicotine lozenge (Nicoret)</b>	2 mg and 4 mg lozenges. Maximum: 20 4 mg lozenges/day	May delay weight gain; should not be chewed or swallowed; Eating or drinking acidic foods or beverages within 30 min. of use reduces effectiveness  Side effects: nausea, heartburn, headache	\$30 - \$64  (depending on dose and number of pieces in package)
<b>Nicotine patch (Nicoderm)</b>	Doses vary from 7 to 21 mg and should be tapered as therapy progresses; should start with 21 mg if patients smokes $\frac{1}{2}$ pack per day or more	Site of patch should be changed daily; 16- and 24- hr. patches have comparable effectiveness  Side effects: skin reactions, headaches, insomnia, vivid dreams  If insomnia or vivid dreams, can remove patch overnight	\$39 - \$148  (14 patches, 21 mg. each)
<b>Nasal spray (Nicotrol NS)</b>	1 dose = 2 0.5mg sprays. Maximum: 40 doses per day (5 per hr.)	Dependence potential is intermediate between other nicotine replacement therapies and cigarettes.  Side effects: nasal irritation within first 2 days that often continues with use	\$290 - \$313  (4 nasal sprays 10 ml)
<b>Bupropion, sustained release (Zyban)</b>	150 mg. in a.m. for 3 days, then increased to 150 mg. bid but can continue 150 mg once daily if side effects with the higher dose  Begin Tx 1-2 wks. before quit date, continue 12 wks. – 6	Can be combined with nicotine replacement Tx for increased effectiveness though data are limited.  May be helpful for patients with Hx of depression, although FDA "black box" warning that bupropion may increase suicidality in patients with depression  Side effects: insomnia, dry mouth	\$35 - \$78  (60 150 mg. tablets)

	mo. after quit date.  Some data show a benefit in relapse prevention when continuing bupropion for 1 year. <sup>44</sup>		
<b>Varenicline (Chantix)</b>	Days 1-3: 0.5 mg/d  Days 4-7: 0.5 mg bid  Day 8 to end of Tx: 1 mg bid  Begin Tx 1 wk. before quit date, continue for 12 wks, an additional 12 wks can be added if quit attempt is successful to increase chances of long-term abstinence	Safety of combining varenicline with bupropion or nicotine replacement has not been established but could be considered if monotherapy is ineffective  Side effects: headache, nausea, insomnia, abnormal dreams, flatulence  Increased risk of cardiovascular events in smokers with CVD  FDA boxed warning: may cause serious neuropsychiatric symptoms including behavior change, hostility, agitation, depressed mood, suicidal thoughts and behavior, and attempted suicide.	\$280 - \$319 (1 box of 53 tablets)
* Retail prices obtained from GoodRx.com, accessed September, 2015. Actual prices that any given patient will pay will vary with the details of their health insurance coverage.			

### Combination therapy

Bupropion has been examined in combination with NRT and was found to have a non-significant trend toward higher cessation rates than with bupropion alone.<sup>45</sup> One study also has demonstrated greater success, but more side effects, of varenicline in combination with NRT compared to varenicline alone (49% v. 33% cessation rate at 24 weeks).<sup>46</sup> In another trial, the combination of varenicline and bupropion had greater cessation rates, but also more side effects than varenicline alone (37% v. 28% cessation rate).<sup>47</sup> These combination therapies might be considered if monotherapy is not effective.

### Other therapies for smoking cessation

Not enough high-quality data exist on which to base recommendations about the efficacy of acupuncture, hypnosis, or any other alternative therapy for smoking cessation.<sup>48</sup> Some data suggest that nortriptyline, a tricyclic antidepressant, is helpful for smoking cessation and could be considered as an alternate therapy.<sup>45</sup>

## Summary

### Step 1: Ask

- Ask if your patient uses tobacco

### Step 2: Engage

- If patient uses tobacco, advise them to quit at every clinical contact
- Motivational interventions (“5 Rs”) should be used with patients who are not yet ready to quit smoking

### Step 3: Act

- Prescribe tobacco treatment medications along with behavioral counseling to increase success rates
- Heavy smokers should be encouraged to use higher doses of a nicotine replacement therapy, or more than one form (“patch plus” regimen)
- Pregnant smokers should be offered in-person psychosocial interventions (because smoking cessation therapies carry risks in pregnant women)
- Sustained-release bupropion or a nicotine replacement therapy (particularly gum and lozenges) may be more appropriate for smokers who are concerned about weight gain after quitting
- Can consider combination therapies of more than one type of pharmacologic treatment if monotherapy is not effective

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