2018 ACC Expert Consensus Decision Pathway on Tobacco Cessation Treatment

A Report of the American College of Cardiology Task Force on Clinical Expert Consensus Documents

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PREFACE

The American College of Cardiology (ACC) develops a wide range of policy documents to provide members with guidance on clinical topics. Although clinical practice guidelines remain the primary mechanism for offering evidence-based recommendations, such guidelines may contain gaps in their guidance regarding clinical decision making, particularly when equipoise is present in a topic. Expert Consensus Documents are intended to provide guidance for clinicians in areas where evidence may be limited, new and evolving, or lack sufficient data to fully inform clinical decision making.

To increase the impact of ACC clinical policy on patient care, an ACC Presidential Task Force was formed in 2014 to examine the processes and format of ACC’s clinical documents. The main recommendation of the Task Force was a new focus on concise decision pathways and/or key points of care, instead of the traditional longer documents. The Task Force also established criteria for identifying high-value clinical topics to be addressed, as well as an innovative approach to collecting stakeholder input through roundtable or think tank meetings. To complement the new focus on brief decision pathways
and key points, Expert Consensus Documents were rebranded Expert Consensus Decision Pathways (ECDPs).

Although Decision Pathways have a new format, they maintain the same goal of Expert Consensus Documents: to develop clinical policy based on expert opinion in areas which important clinical decisions are not adequately addressed by the available existing trials. ECDPs are designed to complement the guidelines and bridge the gaps in clinical guidance that remain. In some cases, topics covered by ECDPs will be addressed subsequently by ACC/American Heart Association guidelines as the evidence base evolves. The writing groups are charged with developing algorithms that are more actionable and can be implemented in the form of tools or apps to accelerate the use of these documents at point of care. ECDPs are intended not to provide a single correct answer, but to encourage clinicians to ask certain questions and consider important factors as they reach a decision on a treatment plan together with patients. There may be multiple pathways that can be taken for treatment decisions, and the goal is to help clinicians and patients make a more informed decision together.

James L. Januzzi, Jr., MD, FACC
Chair, ACC Task Force on Expert Consensus Decision Pathways

1. ABSTRACT

Tobacco use, especially cigarette smoking, is a major risk factor for cardiovascular morbidity and mortality and is the leading preventable cause of death worldwide. Comprehensive tobacco cessation treatment is a critical component of the clinical care for individuals with or at risk for cardiovascular diseases. The consistent delivery of tobacco cessation treatment remains a significant challenge for healthcare providers. This ECDP provides a structured approach to evaluating and treating tobacco dependence and offers practical guidance for overcoming challenges commonly encountered in the clinical setting. The Decision Pathway recommends that clinicians and practices establish a team-based system of care that recognizes cigarette smoking as a chronic relapsing substance use disorder caused by addiction to nicotine. The care team should ensure that patients are asked about cigarette smoking and other tobacco product use at all clinical encounters. Patients who use any tobacco product should receive clear advice to stop tobacco use and be offered a brief intervention that includes prescriptions for proven pharmacological smoking cessation aids and proactive connection to evidence-based behavioral support based in the healthcare system and/or the community. Former smokers, especially recent quitters (i.e., those who have stopped smoking in the past year), should be monitored closely for possible relapse back to smoking. Nonsmokers (i.e., both former smokers and never smokers) should routinely be asked about exposure to secondhand smoke and advised to avoid it. This ECDP also addresses steps to follow when implementing evidence-based therapies and treating special patient groups while also acknowledging situations for which few data exist. It provides tables and figures to illustrate the steps and tools needed to successfully provide comprehensive tobacco cessation treatment.

2. INTRODUCTION

Tobacco use is the leading preventable cause of morbidity and mortality worldwide, responsible for over 6 million deaths annually (1). Cigarette smoking is the predominant form of tobacco used and is the most dangerous. Despite decades of decline in the prevalence of smoking among both men and women in the United States, 14.1% of U.S. adults—more than 30 million people—smoked in 2017 (2).

Tobacco use can be characterized as a chronic relapsing substance use disorder that is sustained by addiction to nicotine (3). Most smokers attempting to quit pass through repeated cycles of abstinence followed by relapse to smoking before they achieve long-term abstinence. Many smokers do not stop cigarette smoking until they have developed smoking-related complications.

Nearly one-third of U.S. deaths attributed to cigarette smoking are due to cardiovascular disease (CVD) (4). Globally, 10% to 30% of all CVD deaths are attributable to cigarette smoking (5). Tobacco smoking adversely affects all phases of the atherothrombotic disease process, including endothelial dysfunction (6), plaque development and destabilization (7), and imbalances of antithrombotic and prothrombotic factors (8,9), culminating in acute cardiovascular (CV) events (10,11). Clinically, tobacco smoking increases the risk of coronary heart disease (CHD) (including myocardial infarction [MI] and sudden death), cerebrovascular disease (stroke), peripheral artery disease, and abdominal aortic aneurysm (10,12,13). Smoking is also associated with an increased risk of heart failure (14), as well as both atrial and ventricular arrhythmias (15,16). Among those with CHD, continued cigarette smoking after revascularization is associated with adverse clinical outcomes (17,18), particularly stent thrombosis (19).

Experimental, epidemiological, and clinical studies demonstrate a nonlinear dose effect of cigarette smoke exposure on CV function and CVD such that a low level of cigarette use is associated with a disproportionately large excess in CV risk (10,11,20–22). This nonlinear relationship suggests that acute, short-term exposure to cigarette smoke is damaging to the CV system, helping to explain
why nonsmokers exposed to secondhand tobacco smoke have a 25% to 30% increased risk of CVD \((20,23)\), and why it is important to advise all cardiac patients to avoid exposure to secondhand smoke (SHS).

Smoking cessation reduces subsequent CV events and mortality \((24,25)\). Virtually all cigarette smokers, regardless of duration or intensity of smoking, comorbidities, or age, benefit from smoking cessation, even if cessation occurs after the development of clinical CVD. Tobacco cessation programs are cost-effective, and their value compares favorably with the management of other CV risk factors \((26,27)\).

The substantial and potentially reversible relationship between cigarette smoking and CVD provides a strong rationale for healthcare providers—particularly the CV care team—to take action in clinical practice to change this modifiable risk factor. Multiple stakeholders agree that it is important to incorporate smoking cessation efforts into practice. However, there is a paucity of guidance for clinical cardiologists and the CV team regarding effective strategies to treat cigarette smoking. The present document was developed to address the CV community’s unmet need for practical smoking cessation guidance. It aims to convey clinical expert consensus recommendations for a feasible comprehensive approach to addressing smoking in clinical practice. Its scope includes assessment of cigarette smoking and nicotine dependence as well as the provision of behavioral, pharmacological, and supportive interventions that can be used in both inpatient and outpatient settings. This document also discusses alternative tobacco products, such as electronic cigarettes, that have appeared more recently in the marketplace. Clinical recommendations about these products are less certain because their net health risks and benefits are still being determined. This document explores the emerging evidence about these alternative tobacco products and CV risk and provides guidance for clinicians discussing such products with patients.

3. METHODS

On January 23, 2017, the Tobacco Cessation Think Tank was convened at ACC’s Heart House by the Prevention of Cardiovascular Disease Leadership Council. The purpose of the meeting was to bring together expert clinicians along with a broad group of stakeholders from a variety of professional societies and federal agencies to discuss the ongoing risk of tobacco and nicotine exposure, emergence of new methods of tobacco and nicotine delivery, and challenges to delivering smoking cessation therapy. Think Tank participants identified the need for expert consensus guidance for comprehensive smoking cessation strategies to improve care for patients with CVD. The purpose of the Decision Pathway was to provide clinical guidance for the CV care team in key areas in which randomized controlled trial (RCT) evidence was inadequate to guide clinical practice. In such instances, experts on the writing committee would provide consensus recommendations for clinical practice while awaiting expansion of the evidence base.

The writing committee was assembled in October 2017. The document and tools provided herein were formulated on the basis of the writing committee’s appraisal of current evidence at the time of committee formation, with additional literature review through January 2018. When evidence was lacking or limited, consensus was developed among writing committee members. The writing committee (see Appendix 1) included representatives from the following areas: clinical cardiology, cardiology fellows-in-training, internists, nursing, pharmacy, clinical pharmacology, psychology, smoking cessation, and vascular medicine. Writing assignments were made according to areas of expertise. Telephone conferences were used to edit contributed content. Writing committee conference calls were confidential and were attended only by committee members and ACC staff. When consensus within the writing committee was deemed necessary by the chair and vice chair, either a roll call vote or an e-mail-generated ballot was implemented. A simple majority prevailed.

The work of the writing committee was supported exclusively by the ACC without commercial support. Writing committee members volunteered their time to this effort. A formal peer review process was completed, consistent with ACC policy, by expert reviewers nominated by the ACC (see Appendix 2). All writing committee members and peer reviewers were required to disclose relationships with industry and other entities. Writing committee and peer reviewer relationships with industry relevant to this document are included in Appendices 1 and 2, respectively. A public comment period was also held to obtain additional feedback. Following reconciliation of all comments, this document was approved for publication by the ACC Clinical Policy Approval Committee.

4. ASSUMPTIONS AND DEFINITIONS

General Clinical Assumptions

- This document is applicable to anyone who smokes tobacco cigarettes, but it gives special emphasis to individuals with CVD. Many recommendations are generalizable to all patients who use other combustible forms of tobacco products such as little filter cigars and cigarillos, or who are exposed to tobacco smoke. The smoking of nontobacco products such as marijuana is not covered in this document.
This document primarily addresses the management of cigarette smokers who are seen in the outpatient clinic setting. However, it includes recommendations for smokers in special clinical circumstances, such as those who are hospitalized with acute CVD processes and those in whom surgery is planned. These settings provide important opportunities to promote smoking cessation.

This document focuses on adults. It does not address tobacco cessation treatment for adolescents or for pregnant women due to special considerations for individuals in these categories.

This document focuses on cigarette smoking and other forms of combustible tobacco products (as defined below) because the inhalation of smoke generated by tobacco conveys a greater CV risk than do products in which tobacco is not burned.

Effective treatment of tobacco dependence is best achieved and managed by a team approach. These algorithms assume that the physician will work along with other healthcare providers and key smoking cessation stakeholders, including nurses, pharmacists, psychologists, certified tobacco treatment specialists (where available), and health department quit services (e.g., telephone quitlines 1-800-QUIT NOW), to guide clinical management. These algorithms are based on the best available evidence. However, all clinical decisions should be governed by clinical judgment and influenced by discussions with the patient to incorporate his or her treatment preferences.

At any point in time, the recommendations and algorithms outlined in the present document may be superseded by new evidence.

Definitions

1. CV patients: A general reference to patients with primarily atherosclerotic disease involving the coronary arteries and/or peripheral vasculature, but also those with valvular heart disease, congestive heart failure, and heart rhythm disorders in whom tobacco use has been shown to be deleterious.

2. Tobacco (or nicotine) dependence: An individual’s perception of the need to smoke characterized by difficulty reducing and/or refraining from smoking for extended periods of time, continued use despite knowledge of harm, and, for most daily smokers, nicotine withdrawal symptoms that develop when chronic exposure to nicotine in tobacco products ends.

3. Current smoker: As defined in the National Health Interview Survey (NHIS), a person who reports currently smoking tobacco every day (i.e., daily smoker) or on some days (nondaily smoker). NHIS also requires a current smoker to have smoked at least 100 cigarettes (5 packs) in his or her lifetime (2).

4. Former smoker: As defined in NHIS, a person who does not currently smoke tobacco but has smoked at least 100 cigarettes in his or her lifetime. Because relapse to smoking occurs frequently after quitting, long-term abstinence is often operationally defined as 6 months of abstinence. Abstinence from smoking for at least 7 days in a row is the criterion often required in clinical studies for an individual to be considered a former smoker in the short-term.

5. Never smoker: A person who has not smoked tobacco regularly and does not now smoke every day or some days. NHIS defines never smoker as an individual who has not smoked 100 cigarettes (5 packs) in his or her lifetime (28).

6. Nonsmoker: A person who is currently either a former or never tobacco smoker.

7. Combustible tobacco products: Products that burn tobacco, producing smoke that users inhale (e.g., cigarettes, cigars, cigarillos, pipe tobacco, hookah). Inhaling smoke exposes the user to a much larger spectrum of harmful chemicals and conveys a much greater risk to CV and overall health than does the use of noncombustible tobacco products (e.g., snuff, chew, dip). However, no tobacco product use is risk-free.

8. Alternative tobacco products: Newer nicotine delivery products that differ from conventional combustible and noncombustible tobacco products. This category encompasses electronic nicotine delivery devices, including electronic cigarettes and heat-not-burn (HNB) tobacco products.

9. Electronic cigarettes (e-cigarettes): Battery-operated devices that heat a liquid containing nicotine, propylene glycol, and/or vegetable glycerin and flavorant chemicals to generate an aerosol that the user inhales. Because e-cigarettes do not burn tobacco, they do not produce tobacco smoke.

10. HNB tobacco products (also called heated tobacco products): A category of tobacco products that heats tobacco to a lower temperature than required for combustion. The result is an aerosol (but not smoke) that the user inhales.

5. CENTRAL ILLUSTRATION

Figure 1 summarizes the 2018 ACC Expert Consensus Decision Pathway for Tobacco Cessation Treatment. Readers should refer to the individual algorithms for the detailed clinical workflow for each patient scenario and clinical setting.
6. DESCRIPTION AND RATIONALE

6.1. Overview of the Decision Pathway for Smoking Cessation Treatment

The ACC Expert Consensus Decision Pathway for Tobacco Cessation Treatment is a systematic stepwise guide for addressing cigarette smoking efficiently and effectively during a routine office-based clinical encounter. Overall, it builds upon the evidence-based framework outlined in the 2008 U.S. Public Health Service (USPHS) Clinical Practice Guideline for Treatment of Tobacco Use and Dependence (29), with modifications reflecting newer evidence and changing patterns of practice.
The USPHS system for office practice, often referred to as the “5As,” consists of the following 5 steps: 1) ask all patients about tobacco use; 2) advise all smokers to quit tobacco; 3) assess a smoker’s readiness to quit tobacco; 4) assist smokers to quit; and 5) arrange follow-up. Since publication of the USPHS recommendations, tobacco dependence treatment has become increasingly recognized as the management of a chronic relapsing disorder, and an alternative to asking whether a smoker is ready to be treated is simply to offer smoking cessation treatment to every smoker, with patients having the option to refuse treatment (i.e., opt out) (30). This approach is consistent with the management of other chronic diseases such as hypertension and diabetes, for which clinicians offer patients treatment as a standard of care rather than asking if they wish to be helped. The opt-out approach is appropriate for smokers in the inpatient setting as well.

The ACC Expert Consensus Decision Pathway for Tobacco Cessation Treatment reflects a team-based “opt-out” version of the USPHS smoking cessation clinical guidelines, with modifications tailoring the approach for clinicians caring for patients with or at risk for CVD in different treatment settings. The 5 basic steps, which are intended to be the joint responsibility of the CV team, are: 1) ask about and document every patient’s tobacco use status and exposure to secondhand smoke at every visit using a standardized assessment method; 2) assess current smokers’ degree of nicotine addiction, former smokers’ risk of relapse, and all nonsmokers exposure to SHS; 3) advise all tobacco users to quit, emphasizing the personal benefits of cessation rather than the harms of continuing to smoke, and advising all nonsmokers to avoid SHS exposure; 4) offer and connect smokers to appropriate treatment options (prescribing pharmacotherapy and actively linking smokers to behavioral support available in their healthcare institution or in the community; and 5) follow-up with patients at subsequent visits to monitor smoking status and sustain engagement in smoking cessation treatments as needed. Implementing this system into office and hospital practice requires addressing systems of care delivery, which are considered below in Section 6.1.10., Training and Implementation.

Tobacco Use Status. The first step is to ask every patient about smoking and other tobacco use at every visit. An office-wide system should be in place to facilitate the universal identification of tobacco users and the recording of tobacco use status in the electronic health record (EHR) or other healthcare record. To facilitate routine assessment, some health record systems add assessment of smoking and tobacco use to the vital signs module.

Because smokers are increasingly using multiple types of tobacco products, the questions must extend beyond asking about cigarette smoking and encompass the use of other tobacco products such as cigars, hookah, smokeless tobacco and electronic cigarettes. Because approximately 20% of current smokers, especially young adults, do not smoke daily and may not even consider themselves to be smokers (31), tobacco use should be assessed with a broad question such as “Do you ever use (smoke) any tobacco product?”

Adding the diagnosis of Current Tobacco Use or Former Tobacco Use to the patient’s problem list is recommended to indicate to the patient that it is a chronic health problem requiring sustained attention. Keeping it on the problem list also alerts the patient’s other providers to reiterate smoking cessation advice at their visits and facilitates coordination of tobacco treatment efforts across providers.

Exposure to Tobacco Smoke. Because SHS exposure increases nonsmokers’ CVD risk (23), all patients should also be asked about SHS exposure routinely in clinical practice. Smoke-free policies in the United States have made most public places and many workplaces, restaurants, and bars smoke-free. Consequently, the home is now the primary site of SHS exposure. Simple screening questions to assess for SHS exposure include: 1) does any smoker live in your household; and 2) are you exposed to smoke in your home or car? In the context of a cardiology practice, the question, “In the past 7 days, were you exposed to secondhand smoke where you live?” correlated significantly with serum cotinine levels (cotinine is a nicotine metabolite and biomarker of second-hand tobacco exposure) and outperformed other questions asking about SHS exposure (32). Systematic assessment of SHS exposure should be incorporated into EHRs. Although EHRs routinely ask about current smoking, they rarely assess SHS exposure in a systematic way. Beyond screening for SHS exposure, cardiology clinicians are well-positioned to inform patients about the CV risk of SHS exposure and to recommend the adoption of smoke-free policies for home and car and the avoidance of other indoor venues where smoking is permitted (see Section 6.1.8.4., SHS Exposure).

6.2. Algorithm for Current Smokers

Actions for current smokers include these 4 tasks: 1) assessment; 2) advice to quit; 3) offer and provide treatment; and 4) follow-up.

1. Assessment of Tobacco (Nicotine) Dependence. The strength of an individual’s nicotine dependence is a key predictor of how likely the individual is to relapse after stopping smoking. A simple screen for nicotine dependence is to ask whether an individual smokes every day or only on some days. For treatment purposes, virtually all persistent daily smokers are nicotine dependent and are likely to benefit from
2. Advice to Quit: The second step is to provide strong, clear, personalized advice to the smoker to quit all tobacco use as soon as possible, with helpful phrases like, “As your doctor (or healthcare provider), I want you to know that quitting smoking now is the best way for you to improve your health.” Ideally, the advice should be tailored to the individual’s specific health situation and should emphasize the benefits of stopping smoking (e.g., financial savings, health benefits, behavioral control, setting an example for others), rather than focusing solely on the harms of continued smoking. For smokers who are post-myocardial infarction, the clinician can emphasize the rapid reduction in the chance of future CV morbidity and mortality by saying, for example, “Quitting smoking now is the best way for you to avoid another heart attack.” After percutaneous coronary intervention, coronary artery bypass grafting, or interventions for peripheral artery disease, the clinician can emphasize the importance of quitting to preserve stent or graft patency.

3. Offer Treatment and Connect to Resources. The third step is to offer smoking cessation treatment, which translates into providing a pharmacotherapy prescription and actively connecting the patient to behavioral support resources. This can be done with a statement such as, “There are effective treatments to help smokers quit and I can help you identify the best one for you today.” Patients are encouraged to set a quit date, usually within the next month, to provide a structure for the quit attempt.

Pharmacotherapy: Pharmacotherapy should be offered to every patient who is willing to accept it, with rare exceptions. It can also be started even in patients who are not ready to quit smoking immediately, because it can help motivate patients to reduce their smoking and increase the odds of them eventually making a quit attempt. Discussing and prescribing cessation medications is a critical role for clinicians. Prescriptions should be written even for over-the-counter medications because insurance plans might cover them, thereby reducing cost to the patient, reinforcing the importance of using the medication, and automatically documenting it in the patient’s EHR. Choice of pharmacotherapy is discussed in Section 6.1.3., Treatment Options: Pharmacological Interventions.

Behavioral support: Either the clinician or office staff should proactively connect a smoker to his/her preferred form of behavioral support. The contents of these programs are described in Section 6.1.5., Treatment Options: Nonpharmacological Behavioral Interventions. Studies have shown that a clinician’s active referral to a behavioral support program for smoking cessation is more effective than simply providing advice or information about these

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**TABLE 1**

<table>
<thead>
<tr>
<th>How many cigarettes do you smoke?</th>
</tr>
</thead>
<tbody>
<tr>
<td>0: 10 or fewer</td>
</tr>
<tr>
<td>1: 11-20</td>
</tr>
<tr>
<td>2: 21-30</td>
</tr>
<tr>
<td>3: ≥31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How soon after waking up do you smoke your first cigarette of the day?</th>
</tr>
</thead>
<tbody>
<tr>
<td>0: After 60 minutes</td>
</tr>
<tr>
<td>1: 31-60 minutes</td>
</tr>
<tr>
<td>2: 6-30 minutes</td>
</tr>
<tr>
<td>3: within 5 minutes</td>
</tr>
</tbody>
</table>

Level of nicotine dependence is computed by adding the scores together as follows:
- 0–2 = low nicotine dependence
- 3–4 = moderate nicotine dependence
- 5–6 = high nicotine dependence

Adapted from reference (33).
resources passively to the patient (34). Options include a health center–based tobacco cessation program, if available, or free resources provided by telephone (e.g., 1-800-QUIT NOW) or online (e.g., www.smokefree.gov, Becomeanex.org). The patient should leave the visit with a set of freely available resources and a plan and time line for accessing the referred behavioral therapy (Table 2). For current smokers who decline the offer of treatment at the visit, treatments should be offered again at every subsequent visit because the motivation to stop smoking varies over time.

4. Follow-Up. Because a smoker’s risk of relapse is highest in the first few days and weeks after making a quit attempt, a follow-up contact to monitor a patient’s tobacco cessation treatment should occur within 2 to 4 weeks of the initial visit, either in person, by phone from the office, or via a patient portal in the EHR (e.g., MyChart). Close monitoring also demonstrates to patients that the clinician assigns a high priority to tobacco treatment and may encourage patients to sustain their effort to become smoke-free. Actions that should occur in follow-up contacts include assessing smoking status, asking about adherence and response to treatments, providing support and encouragement to remain or become smoke-free, and addressing any issues that have arisen in the interim (such as barriers or side effects from pharmacotherapy).

6.3. Treatment Options: Pharmacological Interventions

Pharmacotherapy acts synergistically with behavioral counseling to increase quit rates and should be encouraged for virtually all daily smokers and considered on a case-by-case basis for nondaily smokers (35). The U.S. Food and Drug Administration (FDA) has approved 5 nicotine replacement therapy (NRT) products as well as bupropion and varenicline for smoking cessation. Meta-analyses and a recent large randomized controlled trial indicate that each of these medications is more effective than placebo in promoting smoking cessation for 6 months or more (36,37) and that each is safe for use in patients with CVD. Table 3 summarizes dosing, precautions, and adverse effects of the FDA-approved smoking cessation medications.

**Nicotine Replacement Therapy**

In the United States, NRT is available over the counter or by prescription as patches, gum, and lozenges, and by prescription only as a nasal spray and oral inhaler. NRT provides nicotine to reduce withdrawal symptoms, including irritability, anxiety, difficulty concentrating, dysphoria, hunger, weight gain, and sleep disturbances, which occur when a smoker stops smoking. However, NRT does not replicate the pleasurable effects of smoking, in part because the nicotine is absorbed more slowly and produces lower peak blood nicotine concentrations than cigarettes, thereby reducing the rewarding effects. NRT may also reduce the satisfaction from smoking a cigarette if there is a lapse.

Nicotine patches deliver nicotine in a sustained manner throughout the day and are the most convenient delivery system for reducing withdrawal symptoms. More rapidly absorbed forms of NRT, such as gum, lozenges, inhalers, and spray, relieve withdrawal symptoms more quickly than the patch and provide some of the satisfaction associated with smoking.

Each NRT product has about the same efficacy in clinical trials, increasing quit rates with risk ratios of ~1.6 compared with placebo in a meta-analysis (35). Consequently, the choice of NRT product can reflect a patient’s preference. The patch is generally used as the primary product because compliance is greatest for patch, lower for gum or lozenge, and very low for spray and inhaler. Combining the nicotine patch with a more rapidly absorbed form of NRT is more effective than using a single product, with a risk ratio of 1.34 compared with use of a single product in a meta-analysis (35). Combination NRT is now considered the standard of care for using NRT and should be recommended as initial therapy when NRT is chosen.

Many NRT products are sold in different strengths. More dependent smokers do better with high doses of nicotine (recommendations in Table 3). Nicotine patches are typically marketed with doses that taper over 12 weeks, but clinical trials have not found that tapering improves cessation rates, so tapering is optional. Although the typical duration of treatment is 12 weeks, smoking cessation experts often treat smokers for longer periods, until the patient is confident that he or she will not return to smoking. No harm from long-term NRT use has been reported (36). Oral NRT products,
**TABLE 3**  
FDA-Approved Smoking Cessation Medications

<table>
<thead>
<tr>
<th>Drug (Available Doses)</th>
<th>How Sold (U.S.)</th>
<th>Dosing Instructions</th>
<th>Administration</th>
<th>Common Side Effects</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicotine patch  21 mg 14 mg 7 mg</td>
<td>OTC or Rx</td>
<td>Starting dose: 21 mg for ≥10 cigarettes per day. Rotate application site to avoid skin irritation. May start patch before or on quit date. Keep using even if a slip occurs. If insomnia or disturbing dreams, remove patch at bedtime.</td>
<td>Skin irritation</td>
<td>Trouble sleeping Vivid dreams (patch can be removed at bedtime to manage insomnia or vivid dreams)</td>
<td>Easiest nicotine product to use. Provides a steady nicotine level. Combination NRT therapy: Can add pn gum, lozenge, inhaler, or nasal spray to patch to cover situational cravings.</td>
<td>User cannot alter dose if cravings occur during the day.</td>
</tr>
<tr>
<td>Nicotine lozenge 4 mg 2 mg</td>
<td>OTC or Rx</td>
<td>If 1st cigarette is ≥30 minutes of waking: 4 mg. If 1st cigarette is &gt;30 minutes of waking: 2 mg. Use ≥3 months.</td>
<td>Place between gum and cheek, let it melt slowly. Use 1 piece every 1-2 hours (Max: 20/day).</td>
<td>Mouth irritation Heartburn Nausea</td>
<td>User controls nicotine dose. Oral substitute for cigarettes. May be added to patch to cover situational cravings. Easier to use than gum for those with dental work or dentures.</td>
<td>No food or drink 15 minutes prior to use and during use.</td>
</tr>
<tr>
<td>Nicotine gum 4 mg 2 mg</td>
<td>OTC or Rx</td>
<td>If 1st cigarette is ≥30 minutes of waking: 4 mg. If 1st cigarette is &gt;30 minutes of waking: 2 mg. Use ≥3 months.</td>
<td>Chew briefly until mouth tingles, then ‘park’ gum inside cheek until tingle fades. Repeat chew-and-park each time tingle fades. Discard gum after 30 minutes of use. Use ~ 1 piece per hour (Max: 24/day).</td>
<td>Mouth irritation Jaw soreness Heartburn Nausea</td>
<td>User controls nicotine dose. Oral substitute for cigarettes. May be added to patch to cover situational cravings.</td>
<td>Not chewed in same way as regular gum; requires careful instruction. Can damage dental work and be difficult to use with dentures. No food or drink 15 minutes prior to use and during use.</td>
</tr>
<tr>
<td>Nicotine nasal spray 10 mg/0.5 mg (10 mL bottle)</td>
<td>Rx only</td>
<td>Puff into mouth/throat until cravings subside. Do not inhale into lungs. Change cartridge when nicotine taste disappears. Use 1 cartridge every 1-2 hours (Max: 16/day).</td>
<td>Mouth and throat irritation Coughing if inhaled too deeply</td>
<td>User controls nicotine dose. Mimics hand-to-mouth ritual of smoking cigarettes. May be added to patch to cover situational cravings.</td>
<td>Frequent puffing required.</td>
<td></td>
</tr>
<tr>
<td>Varenicline (tablet) 0.5 mg 1.0 mg</td>
<td>Rx only</td>
<td>Days 1-3: 0.5 mg/day. Days 4-7: 0.5 mg twice a day. Day 8-14: 1 mg twice a day. Use 3-6 months.</td>
<td>Start 1-4 weeks before quit date. Take with food and a tall glass of water to minimize nausea.</td>
<td>Nausea Insomnia Vivid dreams Headache</td>
<td>Quit date can be flexible, from 1 week to 3 months after starting drug. Dual action: relieves nicotine withdrawal and blocks reward of smoking. Oral agent (pill).</td>
<td>Has the most side effects of all NRT products. Some users cannot tolerate local irritation to nasal mucosa.</td>
</tr>
<tr>
<td>Bupropion sustained release (SR) (tablet) 150 mg</td>
<td>Rx only</td>
<td>150 mg/day for 3 days, then 150 mg twice a day. Use 3-6 months.</td>
<td>Start 1-2 weeks before quit date.</td>
<td>Insomnia Agitation Dry mouth Headache</td>
<td>May lessen post-cessation weight gain while drug is being taken. Oral agent (pill).</td>
<td>Increases seizure risk: not for use if seizure disorder or binge drinking.</td>
</tr>
</tbody>
</table>

*All are FDA-approved as smoking cessation aids and listed as a 1st line medication by U.S. Clinical Practice Guidelines (Fiore, 2008)†Recommended duration of use for medications is at least 3 months, but extending dose to 6 months is frequently done to prevent relapse to tobacco use. Patch dosing differs slightly from FDA labeling.

FDA = U.S. Food and Drug Administration; NRT = nicotine replacement therapy; OTC = over the counter (no prescription required); Rx = prescription required.
such as gum or lozenges or inhalers (a cigarette-like plastic device), produce relatively low blood nicotine levels and require frequent use (once every 1 to 2 hours) to relieve withdrawal symptoms. Smokers tend not to use the product this frequently unless carefully instructed. Nicotine from oral products is absorbed through the buccal mucosa in the freebase form. Oral products are buffered to be alkaline, keeping nicotine in freebase form. Alkalinity increases the availability of pH-dependent “free base form” or “unprotonated” nicotine, thus enhancing absorption of nicotine though oral mucosa (37). Drinking acidic liquids such as coffee within 10 minutes of using oral NRT acidifies the mouth and impairs nicotine absorption. Smokers should be advised to avoid such beverages before and during product use. Smokers can use an oral NRT product before drinking the morning coffee to avoid impairing nicotine absorption and proactively manage cravings.

**Efficacy and Safety of NRT in Smokers With CVD**

The efficacy of NRT for smoking cessation is well-established in the general population and in patients with stable CVD, but it has yet to be demonstrated in clinical trials of smokers with acute coronary syndrome (ACS) (38). No studies of the effects of combination NRT products in smokers with CVD have been reported, but there is no a priori reason why NRT would not be effective in these clinical subgroups.

With regard to safety, nicotine could potentially contribute to the worsening of CVD through its sympathomimetic properties (39), by constriction of diseased coronary arteries, or by promoting coronary spasm, proatherogenic lipid profiles, insulin resistance, and proarrhythmic effects. Nicotine may also contribute to endothelial dysfunction and myocardial fibrosis (39). However, nicotine levels from NRT are generally much lower than those from cigarette smoking, and NRT does not expose users to combustion products in cigarette smoke that are involved in CVD pathogenesis. Controlled trials, longitudinal studies, and case-control studies of NRT in patients with CVD report no increase in adverse CV events compared with those treated with placebo (40–43). A meta-analysis of NRT studies found an increase in CV symptoms such as tachycardia and arrhythmia, which is expected from the sympathomimetic effects of nicotine, but no increase in major CV events (death, myocardial infarction, stroke) (44). One can conclude that although NRT is probably not harmless, it is much less harmful than cigarette smoking.

**Bupropion**

Bupropion simulates some of nicotine’s effects on the brain by blocking neuronal uptake of dopamine and, to a lesser extent, norepinephrine (45). It relieves nicotine withdrawal symptoms and reduces the reward from smoking a cigarette. Available as a generic drug, bupropion is FDA-approved both as an antidepressant and for smoking cessation. Sustained-release bupropion is similar in efficacy to NRT and is effective in smokers with and without depression (46,47). Bupropion reduces seizure threshold and should not be used in patients who are at increased risk for seizures.

Bupropion is approved for 12 weeks’ use, but extended treatment for 1 year reduced the relapse rate after initial cessation in 1 study (48). Combination therapy with bupropion and nicotine patch is more effective than bupropion alone or NRT alone (38). Bupropion has also been studied in combination with varenicline, showing significantly enhanced quit rates at 12 and 26 weeks but not at 52 weeks (49).

**Efficacy and Safety of Bupropion in Smokers With CVD**

Bupropion is efficacious in smokers with stable CVD (50) but has not shown efficacy in smokers hospitalized with ACS (51–53), likely because hospitalization is often too brief to allow bupropion to achieve active drug levels before discharge. Clinical trials of bupropion in patients with CVD have found no evidence of increased CV events compared with placebo (50–52). The CATS study (Cardiovascular Safety of Varenicline, Bupropion, and Nicotine Patch in Smokers), involving more than 8,000 smokers, found no evidence of an adverse effect on blood pressure and no increased risk of CV events in smokers treated with bupropion compared with NRT or placebo (54).

**Varenicline**

Varenicline is a partial agonist at the z4ß2 nicotinic cholinergic receptor that mediates brain dopamine release and that is believed to be the primary mediator of nicotine addiction (55). As a partial agonist, varenicline activates the nicotine receptor, producing about 50% of the maximal effects as nicotine, and thereby reducing the intensity of nicotine withdrawal symptoms. At the same time, varenicline binds tightly to the nicotine receptor, preventing receptor binding by nicotine from cigarette smoke and reducing the rewarding effects of smoking. Nicotinic receptor antagonism from varenicline results in reduced pleasure from smoking and is believed to explain why some smokers reduce their cigarette consumption even before their designated quit day and why varenicline may reduce the likelihood of transition that an individual who slips and smokes a cigarette will return to regular smoking.

Varenicline is proven to be more effective in promoting smoking cessation than single NRT or bupropion in several clinical trials (56). The largest was the EAGLES randomized controlled trial (Evaluating Adverse Events in a Global Smoking Cessation Study), which included over 8,000 smokers (46). It compared varenicline, bupropion, nicotine patch, and placebo given for 12 weeks along with brief counseling. Continuous quit rates from weeks 9 to 24...
were: varenicline (21.8%); bupropion (16.2%); nicotine patch (15.7%); and placebo (9.4%). Quit rates were higher in smokers without psychiatric illness than in those with psychiatric illness, but the relative efficacy across drugs was similar. Extending varenicline for 6 months to prevent relapse is effective and has been approved by the FDA (57). Meta-analyses suggest that varenicline and combination NRT are similarly efficacious as stand-alone therapies, making these 2 approaches first-line recommendations for smoking cessation in smokers with CVD (58).

The efficacy of a combination of varenicline and nicotine patch to promote smoking cessation has been studied with mixed results (59,60). Although the mechanism of benefit for adding nicotine to varenicline is not clear, the combination is generally well-tolerated and is an option for smokers who do not succeed with the individual products alone.

Case reports of possible neuropsychiatric effects of varenicline, including depression, psychosis, and suicide, were received by the FDA soon after varenicline entered the market in 2006 (61). In 2009, the FDA required a black box warning for such events, leading many physicians and patients to be reluctant to use this medication. However, these concerns were not confirmed by the results of the EAGLES trial, and the FDA removed varenicline’s black box warning in 2016. Among more than 8,000 smokers in the EAGLES trial, over one-half of whom had stable mild-to-moderate psychiatric disease, there was no evidence of more frequent neuropsychiatric side effects with varenicline than with NRT or placebo (46). For all medications in the trial, adverse neuropsychiatric effects were more frequent among smokers with a history of psychiatric disease than among those without.

**Efficacy and Safety of Varenicline in Smokers with CVD**

Varenicline is more effective than placebo in smokers with stable CVD and ACS (62-64). In the EVITA trial (Evaluation of Varenicline in Smoking Cessation for Patients Post-Acute Coronary Syndrome) 12 weeks of varenicline initiated in hospitalized patients with ACS produced significantly greater smoking cessation rates compared with placebo—a finding that persisted for 52 weeks (point prevalence abstinence 39.9% vs. 29.1%) (62,64). The possibility of adverse CV effects of varenicline has been raised because it has nicotine-like effects (65,66). A large clinical trial of varenicline in smokers with stable CVD found low CV event rates and no significant differences from placebo (63), but a meta-analysis reported a small but significant increased risk of CV adverse events with varenicline (67). Subsequently, several larger meta-analyses, a large retrospective cohort study, and a clinical trial among smokers with ACS all found no increase in CV risk with varenicline use (62,64,68–71). A recent observational study reported a 34% increase of CV adverse events by subjects while taking varenicline compared with a period preceding the start of varenicline, but the absolute risk was very low, estimated to represent an absolute increase of 3.95 CV adverse events attributable to varenicline per 1,000 varenicline users (72,73). Furthermore, limitations of this report, including the potential for residual confounding in an observational study, have been pointed out (73). The CATS trial examined CV events in 8,058 smokers and found no evidence of increased events compared with bupropion, nicotine patch, or placebo (54). These smokers were not selected for having CVD but did have a moderate prevalence of risk factors that was similar to the general population of middle-aged smokers. Given the overall data, the committee considered varenicline to be safe for use in stable CVD and, with caution, in patients with ACS (see “Pharmacotherapy Recommendations” section and Table 4).

**Preloading Pharmacotherapy**

Medication preloading involves starting pharmacotherapy while the smoker is still smoking, with the intent of reducing the satisfaction from smoking, reducing the number of cigarettes smoked per day, and enhancing the likelihood of quitting smoking subsequently. Clinical trials of NRT preloading have had mixed results (74,75). Separate trials of NRT and of varenicline with a flexible quit date have been promising (76). The appeal of the preloading approach is that a smoker who would like to quit but is not ready to set a quit date can be prescribed a medication to reduce tobacco use and make a future quit attempt easier.

**Gradual Reduction**

Another approach for smokers not ready to quit abruptly is a gradual reduction of the number of cigarettes smoked per day. A meta-analysis of gradual reduction versus abrupt quitting found similar quit rates (77). A subsequent randomized trial that compared abrupt quitting versus reducing cigarette smoking for 2 weeks prior to quitting found that abruptly quitting cigarette was more effective. It is worth noting that in this trial, a substantial number of those in the gradual reduction group were also successful in quitting. In contrast, varenicline-assisted gradual reduction over 3 months before the quit date was shown to enhance quit rates over placebo in a study that enrolled smokers who were not ready to quit in the next 30 days (78).

**Other Smoking Cessation Medications**

In controlled clinical trials, nortriptyline and clonidine have been shown to enhance smoking cessation, but they are not FDA-approved for this indication and are rarely used. Nortriptyline’s potential for QT prolongation in patients with CVD should also be considered. Cytisine—a
TABLE 4  Recommended Pharmacotherapy for Smoking Cessation in Patients with CVD

<table>
<thead>
<tr>
<th>Category</th>
<th>Outpatient With Stable CVD</th>
<th>Inpatient With ACS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st line</td>
<td>Varenicline OR combination NRT†</td>
<td>In-hospital to relieve nicotine withdrawal: Nicotine patch OR combination NRT*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>At discharge: Combination NRT or varenicline†</td>
</tr>
<tr>
<td>2nd line</td>
<td>Bupropion OR single NRT product</td>
<td>At discharge: Single NRT product</td>
</tr>
<tr>
<td>3rd line</td>
<td>Nortriptyline‡</td>
<td>n/a</td>
</tr>
</tbody>
</table>

*Combination NRT comprises a nicotine patch plus the patient’s choice of nicotine gum or lozenge or inhaler or spray.
†Some committee members planning to use varenicline would start it in-hospital; others would not start until discharge. Regardless, continue nicotine patch or short-acting form for 1 week to manage nicotine withdrawal symptoms during up-titration of varenicline dose.
‡Nortriptyline is not FDA-approved for smoking cessation indication and there are few data on use in patients with CVD.
§Bupropion is listed as 3rd line because of no evidence of efficacy when started during hospitalization for acute ACS or acute MI. However, there are no special safety concerns for bupropion in this setting.

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Pharmacotherapy Recommendations

All FDA-approved smoking cessation medications (NRT, bupropion, and varenicline) promote smoking cessation and are tolerable and effective options for smokers with stable CVD. In the general population of smokers, meta-analyses indicate that varenicline and combination NRT are more effective than bupropion or single NRT products, making these 2 approaches first-line recommendations for smoking cessation, including in smokers with CVD (Table 4). Single NRT and bupropion are considered second-line therapies for individuals with CVD who are not able or willing to use first-line choices. In the general population of smokers, combinations of these classes of medications (NRT plus varenicline or bupropion, or varenicline plus bupropion) are supported by a smaller body of evidence, but these combinations are tolerable to patients and have generated promising efficacy data. The committee recommended using combinations of agents for smokers who have only a partial response and fail to achieve complete tobacco abstinence with individual agents.

Fewer data about the efficacy and safety of cessation medications for smokers with unstable CVD are available to guide recommendations. Varenicline has demonstrated efficacy in a randomized trial of smokers hospitalized with ACS who started the medication in the hospital; no significant difference in major CV events was found between the varenicline and placebo groups over 52 weeks. In contrast, bupropion was not effective for cessation among hospitalized smokers with acute MI or ACS in 2 trials (51,52). No randomized trial has tested the efficacy or safety of NRT in ACS. However, in light of the evidence on equivalent efficacy of combined NRT and varenicline in the general population of smokers, the committee recommends either treatment for smokers with ACS. The patient’s ability to afford the medications can be a consideration. Nonprescription forms of NRT are not uniformly covered by health insurance. Varenicline is often covered, but with copay and sometimes with restrictions.

Committee members differed regarding when to initiate varenicline in patients with ACS. Some recommended starting varenicline in the hospital (accompanied by NRT as needed to manage acute nicotine withdrawal symptoms while varenicline is titrated to full dose), while others recommended starting varenicline at or after discharge. Those favoring initiation in the hospital argued that starting immediately generates effective blood levels more rapidly and having varenicline listed on the discharge medication list maximizes the likelihood of patient adherence after discharge. Other committee members felt that varenicline should start only at or after discharge because CVD has been stabilized before that time. These committee members were concerned about varenicline’s tolerability in inpatients who are often receiving loading doses of antiplatelet agents that also cause nausea and other gastrointestinal symptoms. As the discharge medication, these clinicians preferred using NRT, noting that it achieves steady-state dose more rapidly than varenicline.

Traditionally, medications are prescribed to smokers who plan to quit and are willing to set a quit date in the next month/near future. However, given the magnitude of harm from continued tobacco use in the presence of CVD, existing data support the use of pharmacotherapy in alternate ways, including preloading of pharmacotherapies or use as tools to help smokers reduce tobacco use immediately with the goal of achieving complete abstinence subsequently. Finally, most of the clinical trials demonstrating the efficacy of these medications provided behavioral counseling along with pharmacotherapy, highlighting the importance of providing behavioral support either in office or by referral to a

partial agonist of nicotinic acetylcholine receptors with an affinity for the α4β2 receptor subtype—has a mechanism similar to varenicline. It has been used as a smoking cessation aid in Eastern Europe for decades but is not approved for use in the United States despite calls for licensing it worldwide after 2 randomized trials found it to be more effective than placebo for short- and long-term abstinence (79,80).
community-based resource along with a pharmacotherapy prescription.

6.4. Treatment Options: Nonpharmacological Behavioral Interventions

Nonpharmacological treatments for tobacco dependence include behavioral skills training using cognitive behavioral therapy techniques, motivational interviewing, and incentives to motivate and reinforce behavior change (29,81-85). These strategies are often used in combination. Behavioral treatments, based on principles of behavioral and cognitive psychology, attempt to bolster smokers’ self-control over their smoking behavior by helping them change unhelpful cognitions (i.e., thoughts, beliefs, and attitudes) and by structuring efforts to change smoking behavior through a range of techniques such as goal setting (e.g., setting a quit day), self-monitoring (e.g., record keeping to identify times and places where at which someone smokes), rewards, and skills training to help smokers learn, practice, and implement techniques to help them resist urges to smoke after quitting (81). Motivational interviewing is a goal-oriented, client-centered counseling style that attempts to help smokers change behavior by exploring and resolving ambivalence about making changes in their behavior.

A recent randomized trial reported that addition of financial incentives to free cessation aids (NRT, bupropion, varenicline) or free e-cigarettes resulted in a significantly higher rate of sustained (6 months) smoking abstinence than did free cessation aids or free e-cigarettes alone. Smokers who received only information and motivational text messages with free cessation aids or e-cigarettes had a significantly lower sustained smoking abstinence rate (86). Financial incentives to promote quit attempts or achieve tobacco abstinence have not been widely implemented in practice. Examples of how some of the above strategies are applied in smoking cessation interventions are described briefly in Table 5.

A clinician’s advice to stop smoking and brief guidance provided in office practice can be made more effective by connecting smokers with other resources available to the treatment team. This may include a tobacco treatment specialist in the healthcare system or a referral to community-based resources (Table 2). Automated systems that link smokers to specialized treatment services can improve outcomes by ensuring all smokers receive assistance to stop smoking (87,88). Behavioral treatments work best when combined with pharmacological smoking cessation treatments and delivered by trained tobacco treatment specialists over multiple face-to-face and/or phone sessions with smokers (29,89-91).

Table 6 describes the delivery formats of different stop-smoking interventions with evidence of effectiveness (89). The most effective delivery formats for providing tobacco cessation treatment are widely underutilized because most clinicians do not have specialized training in delivering such treatment (94). In addition, healthcare systems are inconsistently and inadequately reimbursed for delivering multisession behavioral treatments to smokers. Consequently, brief interventions consisting of advice to stop smoking delivered by a doctor or nurse combined with pharmacotherapy is typically the most common way smokers obtain assistance to stop smoking. Nevertheless, even just advice to quit from a doctor has a positive effect on increasing quit rates (95).

For more complicated cases (i.e., patients not ready to quit, high nicotine dependence, comorbidities), smokers benefit by being connected to providers who have

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### TABLE 5 Examples of Behavioral Interventions for Nicotine Dependence

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive behavioral skills training</td>
<td>Instructions, modeling, rehearsal, and feedback to teach smokers how to change their smoking behavior. Examples include:</td>
</tr>
<tr>
<td></td>
<td>1. Self-monitoring to identify triggers for smoking. Smokers are asked to keep a real-time record of the times, places, and situations in which smoking occurs.</td>
</tr>
<tr>
<td></td>
<td>2. Behavioral rehearsals, such as practice quit attempts and practicing how to respond to a lapse back to smoking.</td>
</tr>
<tr>
<td></td>
<td>3. Practicing self-control over smoking triggers. Avoiding triggers (e.g., putting away ashtrays, abstaining from alcohol), altering trigger situations (e.g., taking work breaks in a place in which you cannot smoke), using substitutes in place of smoking (e.g., gum, candy, a stress ball, exercise), and refocusing thoughts when cravings arise (e.g., statements of self-determination such as “I can do this”; delay statements such as “wait a minute or 2 and the urge will pass”).</td>
</tr>
<tr>
<td></td>
<td>4. Assertiveness training to help smokers better handle social situations likely to trigger cues to smoking.</td>
</tr>
<tr>
<td></td>
<td>5. Instruction and training (e.g., deep breathing, yoga, mindfulness training) for handling stress and negative emotions that are often linked to smoking urges.</td>
</tr>
<tr>
<td></td>
<td>6. Instructions on how to use medications properly to increase medication adherence and quit rates.</td>
</tr>
<tr>
<td></td>
<td>7. Biofeedback to smokers using a simple breath test measuring expired carbon monoxide to educate patients about immediate health risks from smoking and enhance motivation for cutting down and quitting.</td>
</tr>
<tr>
<td></td>
<td>8. Facilitated discussion with a group of smokers to share effective behavior change experiences and challenges.</td>
</tr>
<tr>
<td>Motivational interviewing</td>
<td>Motivational interviewing is a goal-oriented, client-centered counseling style that aims to elicit behavior change by helping smokers explore and resolve ambivalence about making changes in their behavior. The method relies on counselors eliciting from the clients their own motivations for change, rather than imposing a treatment plan on the smoker.</td>
</tr>
<tr>
<td>Incentives</td>
<td>Incentives, usually provided as cash or vouchers, can be used to motivate smokers to try to quit and to reward them for making changes in their smoking behaviors.</td>
</tr>
</tbody>
</table>

Adapted from references 81-85.
TABLE 6 Delivery Format of Stop-Smoking Interventions With Evidence of Effectiveness

<table>
<thead>
<tr>
<th>Description of Intervention</th>
<th>Delivery Format</th>
<th>Evidence of Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group support with multiple sessions facilitated by a trained smoking cessation specialist plus pharmacotherapy</td>
<td>Group in-person</td>
<td>When properly implemented, increases quit rates by 300% compared with unassisted quitting.</td>
</tr>
<tr>
<td>Individual support with multiple counseling sessions with a trained specialist in smoking cessation, plus pharmacotherapy</td>
<td>Individual in-person</td>
<td>When properly implemented, increases quit rates by 200%-300% compared with unassisted quitting.</td>
</tr>
<tr>
<td>Telephone support with multiple counseling sessions with a trained specialist in smoking cessation plus pharmacotherapy</td>
<td>Individual by phone</td>
<td>When properly implemented, increases quit rates by 50%-100% compared with unassisted quitting.</td>
</tr>
<tr>
<td>Brief advice delivered by a doctor or other healthcare provider, plus pharmacotherapy</td>
<td>Individual in-person</td>
<td>When properly implemented, increases quit rates by 50% compared with unassisted quitting. Adding follow-up visits/calls can increase quit rates.</td>
</tr>
<tr>
<td>Support using mobile phones for smoking cessation. Text messaging, in which smokers receive text messages to support quitting, is the simplest option and does not require a smart phone. Apps that use smartphone technology for more complex interaction-based treatments. Some apps are set up to help smokers monitor their smoking behavior and tailor treatment recommendations accordingly; others offer reminders for taking medications; and some can be used to establish reward systems with biofeedback.</td>
<td>Phone</td>
<td>Text messaging increases quit rates by 70% when used alone or as an adjunct to other treatment approaches (92,93). The evidence supporting the effectiveness of smartphone apps is currently limited. On a practical level, not everyone has access and/or the ability to utilize mobile phones, especially apps that require smartphone technology.</td>
</tr>
<tr>
<td>Websites that provide information on smoking, tips and tools on how to stop smoking, and links to other treatment resources. <a href="http://www.smokefree.gov">www.smokefree.gov</a> provides an easy-to-navigate website with useful information to help smokers quit.</td>
<td>Online</td>
<td>As an adjunct to other treatment approaches, online systems may be useful. However, as a stand-alone treatment, there is limited evidence that online systems are very effective in increasing quit rates.</td>
</tr>
<tr>
<td>Pamphlets and books offering advice to smokers on how to quit.</td>
<td>Written</td>
<td>As an adjunct to other treatment approaches, written materials may be useful. However, there is little evidence that written materials (e.g., self-help guides) are effective in increasing quit rates when used as a stand-alone treatment.</td>
</tr>
</tbody>
</table>

Individuals using smoking cessation medications should be encouraged to continue use for at least 3 months. Extended use of medications for up to 6 months has been shown to increase long-term abstinence (36,57). Follow-up contacts with the smoker, at least monthly for the first 6 months, are recommended. Such contacts can reinforce the message to remain smoke-free and allow the clinician to both assess whether additional medication is needed to manage nicotine withdrawal and determine whether the patient is struggling and requires linkage to more-specialized tobacco treatment resources (29,81). Contact can be made by sending e-mail or text messages, having office staff call the patient, and addressing smoking routinely at all office visits.

Patients who are abstinent at follow-up contacts deserve praise for their success. For patients who have had a lapse (i.e., smoke a few cigarettes) or relapse (i.e., returned to regular smoking), the clinician should reframe the smokers’ self-perception as having failed, pointing out that abstaining for even a short time represents a partial success from which the smoker can learn lessons for future quit attempts. It is helpful to discuss factor(s) that might have precipitated the lapse/relapse, reassess treatment options, and assess willingness to make another quit attempt (105,106). Patients using smoking cessation medications benefit by continuing to use them even after a lapse so long as they are committed to quit (107).
FIGURE 2 Algorithm for a Former Smoker

Former smoker

Assess risk of relapse based upon time since last smoked

- Highest risk (no smoking for less than 1 month)
- Moderately high risk (no smoking for at least 1 month to 6 months)
- Lower risk (no smoking for 6 months or longer)

Treatment options
- Ask about smoking status on follow-up visits
- Start and/or intensify pharmacotherapy to address nicotine withdrawal
- Connect patients to behavioral/psychosocial treatment program
- Monthly follow-up contact with referral to treatment if relapsed

Treatment options
- Ask about smoking status on follow-up visits
- Continue/adjust pharmacotherapy as needed
- Monthly follow-up contact with referral to treatment if relapsed

Assess all former smokers for SHS exposure and advise adopting smoke-free policy for home and car

Routine follow-up
- 6-month and 12-month
- Referral to treatment if relapsed

* reassess by connecting with the patient within – 1 month via either a face-to-face contact during an office visit, or by sending MyChart query, e-mail or text message, or calling the patient on the phone.

SHS = secondhand smoke.
6.6. Treatment Algorithm for Patients Not Ready to Make a Quit Attempt

Many smokers, despite their general desire to quit, may be unwilling to set a quit date at a visit (108). Smokers who are not currently ready to accept help to quit should receive at least one of two evidence-based motivational treatments: 1) motivational interviewing; and 2) provision of smoking cessation medications as part of a plan to gradually cut back on smoking (Figure 3).

Emerging evidence suggests that motivational interviewing, a nonconfrontational discussion of the pros and cons of changing behavior, can increase quit attempts among smokers initially unwilling to quit (83,109). A counselor asks open-ended questions to elicit a smoker’s understanding of their own risks from smoking, rewards (benefits) of quitting, and roadblocks (barriers to quitting) (29). Healthcare providers with a variety of clinical backgrounds can be trained to deliver motivational interviewing through programs such as those certified by ATTUD (www.attud.org/).

Reducing cigarettes per day via cessation medication in the setting of continued smoking or suggesting behavioral strategies (e.g., delaying the time interval between cigarettes) can also increase later quit attempts and abstinence (110–113). Reducing cigarette consumption allows a smoker to reduce exposure to cigarette cues, provides an opportunity to practice substitute behaviors and coping skills to avoid smoking, and bolsters self-efficacy for quitting. Cigarette reduction may also decrease the severity of withdrawal during quit attempts.

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**FIGURE 3 Algorithm for Patients Not Ready to Quit**

Current smoker not ready to quit now

Treatments
- Motivational interviewing (risks, rewards, roadblocks)
- Prescribe and/or offer free medication samples of stop smoking medications and encourage to reduce quantity smoked
- Discuss the use of non-combustible tobacco product if not interested in using stop smoking medications
- Advise patient to adopt smoke-free home and car policy

Follow-up
Reassess* with patients within 1 month

If ready to quit, refer/connect to stop smoking treatments
If not ready to quit, repeat provision of treatment

+ Reassess by connecting with the patient within ~ 1 month through the following: face-to-face contact during an office visit, sending MyChart query, e-mail or text message, or calling the patient on the phone.
reduction predicts later quitting success (114,115). However, reduction does not substantially reduce the excess CV risk associated with tobacco use because of the nonlinear relationship between tobacco smoke exposure and CVD events; a low level of cigarette smoking is associated with a disproportionately large increase in excess CV risk (10,11).

Smokers not ready to quit may ask about alternative nicotine products such as e-cigarettes. Guidance on e-cigarettes is provided in Section 6.9.2. Smokers who are not willing to attempt cessation should be advised to avoid exposing others to secondhand smoke by adopting smoke-free policies for their homes and cars.

6.7. Delivery of Tobacco Cessation Therapy in the Outpatient Cardiology Care Setting

Cardiologists may find delivering tobacco cessation therapy to be more challenging than addressing other CVD risk factors for several reasons related to the fact that tobacco use is a chronic relapsing addictive disorder. Cardiologists may be discouraged by a misperception that patients who express normal ambivalence to making behavior changes lack motivation to quit tobacco. They may be frustrated by relapses to smoking that occur as a normal consequence of the quitting process. Consequently, cardiologists may regard tobacco treatment to be solely the responsibility of the primary care physician or ancillary support staff. However, delivering tobacco cessation therapy is an important element of contemporary cardiology practice as this intervention positively affects progression of disease and improves outcome in patients with CVD.

Figure 4 outlines a simplified workflow to address tobacco cessation in the outpatient cardiology care setting. In brief, a patient is initially asked about tobacco use and secondhand smoke exposure by a medical assistant/screener. The information is documented in the EMR or other health record, and patients who are current or former smokers are flagged for the cardiology provider’s (cardiologist, cardiology nurse practitioner, or cardiology physician assistant) attention. The cardiology provider assesses the patient’s nicotine dependence (current

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**FIGURE 4** Simplified Workflow to Address Smoking Cessation in the Outpatient Cardiology Care Setting

- **MEDICAL ASSISTANT/SCREENER/NURSE**: Ask about tobacco use/secondhand smoke exposure.
- **CARDIOLOGIST/OTHER CARDIOLOGY PROVIDERS**: Advice to quit, offer treatment; connect/refer to treatment.
- **TOBACCO TREATMENT SPECIALIST, TELEPHONE QUITLINE, www.smokefree.gov website**: Provides behavioral therapy.
- **PRIMARY CARE PHYSICIAN**: Follow-up and reassess; confirms & reinforces adherence to quit plan.
TABLE 7 National Quality Forum Tobacco Treatment Outpatient Quality Measures

<table>
<thead>
<tr>
<th>Measure Description</th>
<th>Percentage of patients age 18 years and older who were screened for tobacco use 1 or more times within 24 months AND who received tobacco cessation intervention if identified as a tobacco user.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part A</td>
<td>Percentage of patients age 18 years and older who were screened for tobacco use 1 or more times within 24 months.</td>
</tr>
<tr>
<td>Part B</td>
<td>Percentage of patients age 18 years and older who were screened for tobacco use and identified as a tobacco user who received tobacco cessation intervention.</td>
</tr>
<tr>
<td>Part C</td>
<td>Percentage of patients age 18 years and older who were screened for tobacco use 1 or more times within 24 months AND who received tobacco cessation intervention if identified as a tobacco user.</td>
</tr>
</tbody>
</table>

Adapted from reference [116].

smokers) or risk of relapse (former smokers), provides firm advice to stop tobacco use, and offers to help make a plan to quit. The cardiology provider’s primary role in treatment delivery is to discuss medication options with the patient and, considering the patient’s preferences, select an appropriate product (or a combination) and prescribe the medication as needed. The cardiology provider should also emphasize to the patient the critical role of using behavioral support when quitting smoking. In most cases, the cardiologist will not provide extensive support during the visit but will previously have worked with office staff to ensure a plan exists for staff to make an explicit connection to a behavioral support resource. Depending on local resources, referral might be made to a tobacco treatment specialist or nurse in the office or hospital, to the free state telephone quitline, and/or to text messaging and other resources found at the www.smokefree.gov website. A medical assistant or administrative staff or nurse in the cardiology practice can: 1) arrange an appointment for a tobacco treatment specialist or nurse in the cardiology practice; and/or 2) make a fax or electronic referral to the quitline and help the patient sign up with the smokefree.gov website to receive text messages; and 3) consider making an appointment with the primary care physician for follow-up. The smoker should leave the office with a prescription for a smoking cessation medication(s) and an explicit plan for connection to behavioral support resource. If logistics and resources allow, the medical assistant or nurse from the cardiology practice can make follow-up calls to the patient to assist in monitoring and compliance by following algorithms as outlined previously.

Focusing on measuring quality efforts in a cardiology outpatient practice can be an effective way to drive performance on the assessment and treatment of tobacco use. National Quality Forum 0028—Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention is a three-part quality measure (Table 7). National Quality Forum 0028 is included in the Cardiology Specialty Measures Group in the Centers for Medicare and Medicaid Services Quality Payment Program Merit-Based Incentive Program (Centers for Medicare and Medicaid Services ID: CMS138v6). It is a mandatory measure for large groups of clinicians who report to the Merit-Based Incentive Program through the web interface.

6.8. Special Clinical Settings

6.8.1. Hospitalized Smokers

Hospitalization, especially for a tobacco-related disease, provides a unique opportunity to promote smoking cessation ([117]). The development of a serious illness, especially CHD, makes the risks of tobacco use personally salient. At the same time, admission to the smoke-free environment of a hospital requires temporary tobacco abstinence and provides an opportunity to receive assistance and initiate a quit attempt. Among hospitalized smokers, starting smoking cessation counseling in the hospital and continuing it for at least 1 month after discharge increases long-term quit rates by 37% ([117]). A cardiologist can be a champion on a team of providers who ensure that each hospitalized smoker’s tobacco use is assessed and that current smokers have nicotine withdrawal actively treated during the inpatient stay and are offered advice to quit and assistance to make a plan to remain smoke-free after discharge.

The Joint Commission used this evidence to develop a 3-item tobacco quality measure set for U.S. hospitals ([118]) that the National Quality Forum endorsed (Table 7). Use of these measures is not mandatory for hospitals, but the committee recommends that all hospitals adopt the measure set, which has been demonstrated to be feasible to implement ([119]).

The Tobacco Measure Set directs hospitals to document these actions (Table 8):

1. TOB-1: Assess tobacco use status of all admitted patients. The guideline defines smoking a cigarette in the 30 days before admission as current smoking. This is a broader definition of current smoking than usual (see Section 4, Assumptions and Definitions). A broader definition was used because individuals may refrain temporarily from smoking during an illness that may precede a hospital admission. The strategy used by most hospitals is to build this question into the templated electronic form routinely completed by clinical staff to admit a patient.

2. TOB-2: Offer tobacco cessation treatment in the hospital to all current smokers. Both medication and counseling must be offered. To minimize the discomfort of nicotine withdrawal following abrupt tobacco abstinence, virtually all smokers should be offered NRT...
at admission, regardless of whether the patient plans to quit after discharge. NRT is used because of its rapid onset of action and overall safety. The nicotine patch is the most often used product because of its ability to sustain nicotine levels over a 24-hour period. It can be supplemented by short-acting nicotine products (lozenges, gum, or an inhaler) on an as-needed basis to sustain nicotine levels over a 24-hour period. It can be used to maintain abstinence from tobacco use for a smoking cessation medication put into the list of discharge medications. This must be completed during the first 3 hospital days.

3. **TOB-3:** Offer tobacco cessation treatment at hospital discharge. Hospitals document the offer (and acceptance or refusal) of both pharmacotherapy and counseling that will continue after discharge. A prescription for a smoking cessation medication put into the list of discharge medication satisfies the pharmacotherapy criterion. All cessation medications (NRT, bupropion, and varenicline) are safe to prescribe at hospital discharge, even in patients admitted with ACS. Combination NRT and varenicline are considered first-line options (Section 6.1.3., Treatment Options: Pharmacological Interventions).

Sustaining counseling support after discharge is a more challenging task. Smoking cessation should be discussed at routine post-hospitalization office visits or cardiac rehabilitation sessions, but this alone is considered insufficient to meet the needs of patients struggling to maintain abstinence because clinicians are often managing multiple CV comorbidities in these settings. The committee recommends that the discharge plan arrange for a dedicated encounter (in person or by phone) for smoking cessation. The visit could be conducted by anyone trained as a tobacco treatment specialist. Hospitals lacking an outpatient smoking cessation program should make a proactive referral to any local community resources and/or to the free telephone quitline system (1-800-QUIT-NOW). Calling this single number results in automatic triage to individual state quitlines, which provide access to evidence-based tobacco cessation services nationwide (Table 2). Referral can be facilitated by creating a proactive electronic referral link (eReferral) between EHRs and state quitlines.

### 6.8.2. Special Clinical Circumstance: the Perioperative Patient

CV specialists and internists refer patients for surgery and provide consultations for perioperative CV risk assessment. Both actions offer opportunities to initiate treatment for smoking cessation. The preoperative context provides unique motivation, a favorable environment, and a tangible incentive to quit smoking (121). Intervening at this key moment may increase the quit rates not only around the time of surgery, but also over the long-term (122). Therefore, smoking cessation before surgery should be routinely recommended to every smoker seen for a preoperative evaluation, regardless of how soon surgery is planned. The benefit to the smoker increases in proportion with the duration of preoperative abstinence, but even brief cessation has benefit (123,124).

The perioperative risks of smoking are well-established. Preoperative smoking has been linked to infection, MI, neurological complications, increased requirement for pain medications, prolonged length of stay, intensive care unit admission, and death (125,126). Smokers undergoing elective surgery have increased odds of thromboembolism, respiratory and wound complications, unplanned hospital readmissions, and mortality, with excess risk lasting at least 1 year after surgery (127). Patients continuing to smoke following percutaneous coronary intervention or coronary artery bypass grafting face poorer long-term outcomes, losing 2 to 3 years of life expectancy compared with those who stop smoking (128,129). Smoking after lower-extremity bypass surgery
increases the risk of graft failure at least three-fold, whereas smoking cessation can restore patency rates to the level of nonsmokers (130). Former or current smoking is also an independent predictor of restenosis after carotid artery revascularization, with both endarterectomy and carotid stents (131).

The optimal timing of smoking cessation before surgery has been debated. Four weeks of tobacco abstinence before surgery clearly reduces the risk of major pulmonary and wound-healing complications (132). If 4 weeks is not feasible, data indicate that the sooner the patient quits, the better, especially for reducing pulmonary complications (124,132). Most important, no convincing data demonstrate that quitting immediately before surgery is harmful (133). Even short durations of preoperative abstinence may reduce perioperative complications and may also lead to continued cessation postoperatively (133). Considering the relatively brief half-lives of both nicotine (~2 h) and carbon monoxide (~4 h), even abstinence on the morning of surgery may have benefit. Morning abstinence is associated with a reduced risk of surgical site infections (134). Thus, patients should be advised that just as they should not eat the morning of surgery, they also should not smoke. Finally, if the patient does not quit preoperatively, quitting postoperatively is still beneficial (135).

The approach to smoking cessation in the perioperative period should mirror the algorithm outlined in Figure 1. Clinicians should clearly convey the urgency to quit as soon as possible when surgery is planned or being discussed. Patients should be informed explicitly of the risks described in the previous text. Both pharmacological and behavioral treatment should be initiated at the initial preoperative consultation, regardless of how long before surgery it occurs, and continued postoperatively. Among patients scheduled for elective noncardiac surgery, varenicline (combined with 1 counseling session and referral to a quitline) increased long-term abstinence by 62% compared with brief counseling and self-referral to a quitline (136). NRT has also been used preoperatively. If cessation does not occur preoperatively, NRT can be used in the immediate postoperative period to mitigate the nicotine withdrawal symptoms triggered by the tobacco abstinence required during hospitalization (135).

In some cases, the patient and the care team (including the surgeon, cardiologist, anesthesiologist, and/or primary care provider) may consider a delay in surgery until the patient has successfully quit for at least 4 weeks. Some surgeons may mandate complete smoking cessation prior to elective surgery. In these circumstances, patients may be uniquely motivated to quit, and CV consultants and internists have an important opportunity to assist the patient contemplating surgery to achieve smoking cessation.

6.8.3. Postcessation Weight Gain

Weight gain after smoking cessation is a common concern for many smokers and may limit both initial willingness to try to stop smoking and long-term abstinence from smoking. Although about 80% of smokers gain weight (an average of 3 to 6 kg) in the first 3 months postcessation (137), prospective studies demonstrate that postcessation weight gain does not attenuate the CV benefits of tobacco abstinence (138-140). Mechanisms for post-smoking-cessation weight gain include a reversal of the appetite-suppressive effect of nicotine, decreased metabolic rate due to less nicotine exposure, and increased caloric intake (141). NRT can help patients control or at least mitigate weight gain following smoking cessation. A Cochrane review found that bupropion, NRT, and varenicline reduced postcessation weight change while the medication was being used (142), but these medications appear to delay rather than prevent postcessation weight gain. On the basis of available data, it is reasonable to advise patients not to replace cigarettes with food and to instead decrease high fat consumption and increase physical activity (142).

In general, patients with an elevated body mass index who smoke should be advised to focus first on smoking cessation rather than on weight loss. Attempting to quit smoking and lose weight at the same time is often an insurmountable challenge. The concept of “Maintain, Don’t gain” can be recommended. Daily exercise should be strongly encouraged, following current national physical activity guidelines that recommend that adults achieve 30 minutes per day of brisk exercise on most days of the week (143).

6.8.4. SHS Exposure

There is a clear scientific consensus that SHS exposure increases the risk of acute CV events and hospitalizations (23,144,145), causing an estimated 33,000 deaths from heart disease annually in the United States. SHS exposure in nonsmokers is also associated with increased risks of atrial fibrillation, peripheral artery disease, and poorer quality of life in heart failure patients. The rapid reduction of CV risk when SHS exposure is eliminated by smoke-free laws emphasizes the potential value of clinician advice to patients with CVD to avoid SHS exposure (23,146,147). Clinicians should screen all patients for SHS exposure. Screening is most important for nonsmokers, because smokers are already exposed to higher levels of toxins when they inhale cigarette smoke directly (Section 6.1.2., Starting Point: Documentation of Tobacco Use and Exposure). However, discussing SHS with current smokers can make them aware of the harm that their smoke causes to others and may prompt them to take actions to protect family and friends. Physician advice to adopt a smoke-free policy for home and car may prompt an action that smokers not yet ready to quit smoking are
willing to take. In longitudinal studies, smokers who implement smoke-free home policies are more likely to try and succeed at quitting (148).

Table 9 outlines actions that the committee recommends that CV healthcare providers take regarding SHS exposure.

### 6.9. Other Tobacco Products

#### 6.9.1. Smokeless Tobacco

Approximately 3.4% of U.S. adults use smokeless tobacco products (145). Products used in the United States are primarily oral snuff (moist ground tobacco placed between the lips and gums) or chewing tobacco (shredded flavored tobacco). Smokeless tobacco products that are sucked and dissolve in the mouth are also sold in a variety of forms.

Smokeless products contain nicotine and sodium bicarbonate, which increases pH to increase nicotine absorption across the oral mucosa. They also contain carcinogenic nitrosamines, low levels of other combustion products generated during curing, and other potential toxins (149). The major health risks of smokeless tobacco use are diseases of the oral cavity, including periodontal disease and tooth decay, and a slightly higher risk of oral cancer (150). Smokeless tobacco use has also been associated with an increased risk of pancreatic and esophageal cancer in some studies (151). Whether long-term smokeless tobacco use can cause or aggravate CVD is less certain because evidence is conflicting (152–154). A meta-analysis of 11 studies found an increased risk of fatal MI (relative risk: 1.13; 95% confidence interval: 1.06 to 1.21) and fatal stroke (relative risk: 1.40; 95% confidence interval: 1.28 to 1.54) among smokeless tobacco users compared with nonusers (155). The studies included in that meta-analysis from the United States and Sweden showed an increased risk of death from myocardial infarction and stroke (155). A review by the American Heart Association concluded that although smokeless tobacco use may convey a much lower risk of CVD than does cigarette smoking, it does pose some risk, particularly in patients with CVD (156). Given the overall evidence, the committee recommends against the use of smokeless tobacco, particularly in patients with CVD. Providers should screen for smokeless tobacco use, advise smokeless users to stop, and offer treatment. Evidence for treatment of smokeless tobacco dependence is less well-established than treatment for cigarette smoking because fewer studies have been conducted. The strongest evidence to date favors varenicline and behavioral support to promote quitting (157). Nicotine lozenges also appeared to enhance quitting. Studies testing use of a nicotine patch and/or bupropion for cessation of smokeless tobacco use have not found these treatments to be effective (157).

#### 6.9.2. Alternative Tobacco Products: E-Cigarettes

E-cigarettes, also known as electronic nicotine delivery systems, differ from cigarettes and other combustible tobacco products in that they do not produce smoke by burning tobacco. Instead, they heat a solution (e-liquid) that usually contains nicotine, propylene glycol or vegetable glycerin, and flavorings to generate an aerosol that the user inhales (12). E-cigarette devices vary considerably in design (Figure 4). First-generation products are disposable devices that mimic the appearance and experience of smoking a combustible cigarette. Second-generation devices are larger and have rechargeable batteries and/or replaceable cartridges of e-liquid. Third-generation e-cigarette designs allow the user to customize the devices by manipulating features such as batteries, temperature, and dose of nicotine (158). The design features of an e-cigarette can have a large impact on cost, safety, and nicotine delivery. Users’ exposure to nicotine and other chemicals in the aerosol depends on the type of device, the components of the e-liquid, and on how the devices are used. Experienced users can achieve levels of nicotine intake similar to that obtained from smoking combustible tobacco cigarettes (158).

Recently, a novel vaping device emerged that differs from previous e-cigarettes in its technology, product design, and marketing. Exemplified by JUUL, the device is designed to resemble a computer flash drive and encapsulates nicotine, flavorings, and other contents in small replaceable cartridges called “pod-mods” (Figure 5) (159,160). The device’s battery, rechargeable via a USB port, heats the liquid to produce vapor. The product differs from prior e-cigarettes in the chemical formulation of nicotine used in the product. Pod-mod devices use nicotine salts, which produces more protonated nicotine at a lower pH than the free-base form of nicotine used in other e-cigarettes, which has a higher pH and activates nicotine sensory receptors. Therefore, the nicotine in the newer devices is less irritating when inhaled. Additionally, these devices can deliver a higher concentration of nicotine to the user (160). A higher dose of nicotine might benefit adult smokers who are seeking to quit cigarettes but might also promote nicotine dependence among nonsmoking adolescents and young adults (161). The product’s sleek design, sweet flavors, marketing strategy
and social-media presence appear to have made it more attractive to youths than earlier e-cigarette products. During 2017, JUUL’s sales accelerated and it captured the largest share of the e-cigarette retail market (159). Although national data on youth use of the products are not yet available, multiple anecdotal reports of youth uptake of JUUL devices appeared in the media during 2018 (160).

E-cigarettes have the potential for large public health benefit if they help smokers to quit smoking combustible cigarettes, especially smokers who have not been willing or able to quit using current treatments. This potential benefit must be balanced against e-cigarettes’ own long-term health risks, which are largely unknown at this time, and against the potential for e-cigarettes to attract youth and young adults who might not otherwise smoke to take up their use and perhaps increase the uptake of cigarettes.

In August 2016, the FDA gained regulatory authority over e-cigarettes, allowing it to enforce laws preventing the sale of e-cigarettes to persons under the age of 18 years, ban provision of free product samples, and regulate the labeling and content of e-cigarettes. A 2018 systematic evidence review by the National Academies of Sciences, Engineering, and Medicine (NASEM) concluded that while scientific evidence is insufficient to allow reliable conclusions to be made about the long-term health effects of e-cigarettes (including CV outcomes or measures of subclinical atherosclerosis), such risks could be less than those associated with smoking, because toxicants and carcinogens present in cigarette smoke are absent or present at much lower concentrations in e-cigarette aerosols (158).

The NASEM report also reviewed existing evidence about the effects of e-cigarette exposure on intermediate disease outcomes. It found “substantial” evidence that short-term exposure to e-cigarette aerosols can cause acute endothelial cell dysfunction, DNA damage, and signs of oxidative stress, as well as temporarily increase heart rate. However, the report noted that the long-term consequence of these changes or the effects of chronic e-cigarette exposure on CV or other biomarkers of chronic disease remain unknown (148). A subsequent cross-sectional study using nationally-representative self-report data found a positive association between daily e-cigarette use and a history of MI (162). However, the study’s cross-sectional design precluded a conclusion about any causal relationship between these two events. The study had no assessments of temporality in exposure, and it is unclear if e-cigarettes were used prior to or after the MI events. More robust studies will be needed to confirm the association between MI and e-cigarette use.

The NASEM noted other safety concerns with e-cigarette devices, such as defective batteries causing explosion and injuries as well as risks of accidental or intentional exposure due to ingestion of or contact with the e-liquids (158). The NASEM report also noted that certain flavorings sometimes found in e-liquids (i.e., diacetyl, cinnamaldehyde) may pose a health hazard and should be avoided (158).

The NASEM report concluded that completely switching from combustible tobacco products to e-cigarettes should reduce short-term adverse health effects of continued smoking, indicating e-cigarettes’ potential for harm reduction (158). However, the report found far less evidence that dual use of both cigarettes and e-cigarettes
TABLE 10  Guidance for Clinicians’ Discussions of E-Cigarettes With Patients

<table>
<thead>
<tr>
<th>Recommendations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>■ Emphasize to smokers the importance of the goal of complete cessation of all combustible tobacco products. Even a single cigarette per day increases cardiovascular risk.</td>
</tr>
<tr>
<td>■ Recommend that smokers use evidence-based, FDA-approved smoking cessation aids, which are known to be safe and effective.</td>
</tr>
<tr>
<td>■ Clinicians should be prepared to discuss the evidence about e-cigarettes’ risks and benefits with patients who ask about them.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Points to cover in a discussion with a patient who asks about e-cigarettes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>■ E-cigarettes are devices that heat a nicotine-containing liquid, producing an aerosol that differs from the smoke produced by burning tobacco.</td>
</tr>
<tr>
<td>■ E-cigarettes contain chemicals in addition to nicotine, including propylene glycol, glycerin, and flavoring chemicals that may pose a risk.</td>
</tr>
<tr>
<td>■ Because they do not burn tobacco, e-cigarettes expose the user to fewer and lower levels of toxic compounds than smoking a cigarette does.</td>
</tr>
<tr>
<td>■ Therefore, if used as a complete substitute for combustible tobacco products, e-cigarettes are expected to be less harmful than smoking combustible tobacco products in the short-term, but their long-term safety is uncertain.</td>
</tr>
<tr>
<td>■ Because e-cigarettes are new products, scientific information about their health effects and effectiveness to help smokers quit is limited and rapidly evolving. They are not currently approved by the FDA as safe and effective cessation aids.</td>
</tr>
<tr>
<td>■ E-cigarettes vary considerably in their design, in the contents of the e-liquids, and in nicotine and toxicant delivery to the user.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If smoker chooses to use e-cigarettes, provide evidence-based advice:</th>
</tr>
</thead>
<tbody>
<tr>
<td>■ Switch completely to e-cigarettes. Avoid dual use of both combustible tobacco products and e-cigarettes.</td>
</tr>
<tr>
<td>■ The eventual goal is cessation of e-cigarettes as well as combustible cigarettes, because of uncertainty about e-cigarettes’ long-term health risks. After stopping combustible tobacco, plan to taper off e-cigarettes.</td>
</tr>
<tr>
<td>■ Heed safety instructions. Choose products with child-proof packaging to minimize the risk of nicotine poisoning of children. Follow instructions for device maintenance, battery recharging, and storage to minimize the risk of explosion.</td>
</tr>
<tr>
<td>■ Avoid using e-cigarettes around children.</td>
</tr>
</tbody>
</table>

FDA = U.S. Food and Drug Administration.

reduces exposures to toxicants or health risks. Currently 60% of adult e-cigarette users also continue to smoke cigarettes (163). The concern is especially relevant to CVD risk, because smoking even one cigarette daily increases CVD risk in epidemiological studies. The NASEM report found only limited evidence that e-cigarettes are effective as cessation aids when compared with no treatment or current FDA-approved cessation therapies, but it found moderate evidence that e-cigarettes may be more likely to lead to smoking cessation when used more frequently as compared to infrequent or intermittent use (158). However, the report found substantial evidence that e-cigarette use by adolescent never smokers increases their likelihood of subsequently trying a cigarette and moderate evidence that this increases the frequency and intensity of subsequent smoking (158). There is widespread agreement that regulatory oversight of e-cigarettes is needed to reduce the risk of youth use of e-cigarettes and transition to combustible cigarettes.

Despite gaps in the evidence base about the effectiveness of e-cigarettes for smoking cessation, many smokers are asking physicians in clinical practice for guidance about e-cigarettes (164). Writing committee members were unanimous on 3 points (Table 9). First, the clinician’s role is to encourage and support a smoker’s efforts to stop using cigarettes and other combustible tobacco products. Second, given the uncertainties of the long-term effects of e-cigarettes on health, a clinician should advise cigarette smokers seeking to quit to use evidence-based, FDA-approved, safe, and effective smoking cessation pharmacotherapies as first-line treatments in preference to e-cigarettes. Third, clinicians should be prepared to discuss the risks and benefits with patients who ask about or are already using an e-cigarette. If a smoker decides to use e-cigarettes, the committee felt that the clinician should play a supportive role, helping the patient to use the product in a way that minimizes risk to themselves and others and indicating that the eventual goal is complete abstinence from all products, including e-cigarettes. Table 10 provides some guidance for clinicians’ discussions with patients about e-cigarette use.

Committee members had a range of opinions about the use of e-cigarettes as a cessation aid, reflecting differing interpretations of the limited evidence about e-cigarettes’ effectiveness for smoking cessation and possible health effects. Approximately one-half of the committee felt e-cigarettes are associated with less short-term harm than combustible cigarettes and may be of benefit for smokers who have been unable to quit smoking after multiple attempts using FDA-approved medications and behavioral support or for smokers who are unwilling to quit but seek to reduce tobacco-related health harms. In these situations, e-cigarette use is likely to minimize risk if smokers switched completely to e-cigarettes, avoided dual use, and used e-cigarettes temporarily as an aid to cessation of both cigarettes and e-cigarettes. Other committee members felt that the limited evidence of benefit of e-cigarettes for cessation of combustible tobacco products and the insufficient evidence regarding long-term health effects outweighed any potential benefits of e-cigarettes at this time.

Like smokers using conventional cessation therapies, those using e-cigarettes should be followed regularly by the clinician or smoking cessation professional. Although there are no data yet to show that behavioral support enhances the potential effectiveness of e-cigarettes for cessation, it is reasonable to encourage e-cigarette users to use the standard resources for behavioral support (Table 2).
6.9.3. Alternative Tobacco Products: HNB Tobacco

“Heat-not-burn” devices are also alternative tobacco products that, like e-cigarettes, do not burn tobacco (165). Unlike e-cigarettes, which heat a nicotine-containing liquid, HNB products heat tobacco itself. A pen-like device heats a tobacco stick to a temperature lower than that required for combustion but high enough to release an aerosol that users inhale. Several tobacco companies are developing these products. They claim that the products mimic the experience of conventional combustible cigarettes, providing the taste of tobacco without smoke, ash, or odor, and thereby reducing the health risks of smoking cigarettes (165). Studies funded by the manufacturers have reported that HNB products produce lower levels of harmful chemicals compared with conventional cigarettes (166). Studies from independent researchers replicating this work are just beginning to be published and raise some question about whether HNB products may actually burn tobacco and whether some harmful chemicals are generated (167-169). Consequently, little is known about the health effects of HNB products. Novel HNB products are not currently approved for sale in the United States, but one tobacco company has applied to the FDA for approval to market its product as a modified-risk tobacco product (158).

6.10. Training and Implementation

Implementation of Tobacco Cessation Treatment Recommendations

Making tobacco cessation treatment a routine component of clinical care provided in cardiology practice requires thoughtful preparation and careful implementation to support alterations in workflows and systems of care. Making healthcare delivery system-level changes does increase the delivery of tobacco treatment interventions, although evidence that these system changes improve cessation rates is more limited (170). Table 11 displays strategies for addressing provider, healthcare delivery system, and educational barriers to implementing tobacco treatment programs in cardiology clinical settings.

An effective strategy requires examination of the workflow and responsibilities for the delivery of tobacco cessation treatment. This includes how patients who smoke are identified, offered treatment, referred for treatment, and followed, to ensure the delivery of treatments for those who want them. Understanding what tobacco treatment resources are available outside of the office and how office staff can effectively connect patients to them is essential. Hiring a trained smoking cessation specialist to deliver treatment in person or by phone can

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**TABLE 11 Strategies for Addressing Barriers to Implementing and Sustaining Smoking Cessation Treatment in the Clinical Setting**

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Strategy</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providers Lack of education</td>
<td>Include smoking cessation treatment content and practice opportunities in healthcare providers’ curriculum.</td>
<td>Advocate for inclusion of questions about smoking cessation information for both licensure and specialty certification in cardiology.</td>
</tr>
<tr>
<td></td>
<td>Provide annual updates about new treatments for smoking cessation.</td>
<td>Include updates in communications to healthcare providers.</td>
</tr>
<tr>
<td></td>
<td>Provide continuing education for current practitioners.</td>
<td>Require that all providers in cardiology settings receive education about smoking cessation.</td>
</tr>
<tr>
<td>Providers Lack of time</td>
<td>Utilize existing resources, including state quitlines, for additional support.</td>
<td>Downloads print resources to give to patients at discharge or end of visit.</td>
</tr>
<tr>
<td></td>
<td>Hire a dedicated smoking cessation counselor to develop a smoking cessation clinic for referral, especially for patients having difficulty quitting.</td>
<td>Contact the state quitline to create proactive referral and provide feedback about contact, receipt of treatment, and quit status to providers.</td>
</tr>
<tr>
<td></td>
<td>Involve and educate ancillary personnel (e.g., assistants, front desk staff) so that all are aware of resources.</td>
<td>Downloadable print resources to give to patients at discharge or end of visit.</td>
</tr>
<tr>
<td>Smoking among healthcare providers</td>
<td>Provide access to smoking cessation treatment to all.</td>
<td>Celebrate and enforce a smoke-free workplace. Inform new hires about smoke-free policies.</td>
</tr>
<tr>
<td>Healthcare delivery system</td>
<td>Modify the electronic health record to create alerts and clinician reminders to ensure that all patients who smoke receive treatment.</td>
<td>Downloadable print resources to give to patients at discharge or end of visit.</td>
</tr>
<tr>
<td>Smoking cessation is not an expected part of care.</td>
<td>Create a dashboard to monitor the number of smokers identified and those who have received treatment.</td>
<td>Contact the state quitline to create proactive referral and provide feedback about contact, receipt of treatment, and quit status to providers.</td>
</tr>
<tr>
<td></td>
<td>Provide feedback to clinicians about the frequency of their delivery of smoking cessation treatment for identified patients.</td>
<td>Expand smoke-free policies for the entire healthcare system to denormalize smoking.</td>
</tr>
</tbody>
</table>

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provide needed smoking cessation support but may not be practical outside of large healthcare systems. A team approach with the involvement of multiple providers may be the most realistic strategy to ensure that the perceived burden is not on any individual healthcare provider.

The EHR provides opportunities to facilitate the implementation of tobacco treatment. If tobacco use information is collected routinely at patient intake, the EHR can push alerts to clinicians to prompt delivery of quit advice and cessation treatment to smokers (171,172). The EHR may be tailored to include prepopulated “Smart Sets” that can facilitate medication prescriptions, referrals for behavioral treatment, and printing of downloadable materials for patients and families. Data analytics in some systems can create, for physicians or practices, a registry of their smokers and the interventions delivered.

Support from key stakeholders in the healthcare system is a critical component to help build consensus and facilitate new or enhanced tobacco treatment services. Strong support from healthcare system leaders is essential for system changes to occur. Clinical champions (e.g., physicians, nurses, physician assistants, respiratory therapists, pharmacists, care coordinators) can provide support during the implementation period. The adoption of smoke-free policies throughout healthcare systems, including outdoor areas, can support implementation of tobacco treatment interventions in clinical practice. Feedback systems that provide information about performance to the provider and the system will help to ensure adoption and maintenance of the change in clinical practice.

**Education of Healthcare Providers**

Education of healthcare providers is important so that they know the process by which patients should be screened, offered tobacco treatment, referred to tobacco treatment, and followed up. Although education is necessary, it is not sufficient to ensure routine delivery of cessation treatment in medical settings. Healthcare providers also need to know their specific role in the tobacco cessation treatment team. Although healthcare providers are generally aware of the CV health risks of tobacco use, few have received the necessary training to deliver behavioral and pharmacological treatments for tobacco dependence treatment (173). Evidence indicates that providers who are trained are more likely to screen and intervene with smokers (174,175). Education can also increase referrals to dedicated tobacco treatment resources in the healthcare system or externally such as state quitlines (176,177). Many online courses in delivering smoking cessation therapy are available. These vary in length and quality. Table 12 lists resources for educational information to support implementation of tobacco dependence treatment.

**Implementation of Hospital-Based Smoking Interventions**

Hospital practice patterns often provide a challenge to the effective delivery of smoking cessation interventions to patients hospitalized for CHD. The low proportion of smokers admitted with acute MI or CHD who receive a cessation medication during or soon after hospitalization (178,179) highlights the need for an evidence-based strategy. Successful program implementation requires buy-in from key hospital officials and tailoring to local strengths, limitations, and priorities. The adoption of completely smoke-free campuses (including outdoor areas) will support a hospital cessation program. Examples of successful implementation of inpatient smoking cessation programs and protocols exist (87,180,181).

Table 13 outlines recommended components of a program.

**Insurance Coverage of Tobacco Cessation Treatment**

Smoking cessation counseling is typically covered by insurance. Medicare Part B covers 2 cessation attempts per year. The current procedural terminology (CPT) codes for smoking and tobacco use cessation counseling visits include 99406 (intermediate session; >3 minutes up to 10 minutes) and 99407 (intensive; >10 min). Minimal counseling (<3 min) is not billable as a separate service, as it is included in the Evaluation & Management (E&M) visit. Each quit attempt includes up to 4 sessions (intermediate or intensive), with a total of 8 sessions per year. The modifier “-25” should be added to the primary E&M service code when adding a tobacco cessation counseling service code on the same date. To bill as a separate service, clear documentation should include the amount of time spent and the pertinent points of the discussion, including current tobacco use, advice to quit, adverse effects of smoking on the patient’s health conditions (medical necessity), willingness to quit, a treatment plan including pharmacotherapy, resources provided, and follow-up arrangements.

Alternatively, reimbursement for the time spent may also be via the primary E&M visit code, assuming that the CV specialist is seeing the patient for other CV issues. The primary diagnosis code for the visit should then reflect the biological impact of tobacco use. Some payers may view the diagnosis code of “tobacco dependence” as a behavioral health service, which may not be covered (182). The American Lung Association has produced a guide to help clinicians bill for tobacco cessation treatment (183).
Centers for Disease Control and Prevention
Tobacco treatment coordinators
Counselor(s)
Administrative leader: nurse, advanced practice provider, Medical director
Advocacy within the organization, addressing medical concerns regarding pharmacotherapy, engaging

University of Wisconsin- Center for Tobacco Research and Prevention
*Small-scale programs can be initiated with part-time efforts by a physician and administrator only.

Participant * Primary Roles
Agency for Healthcare Research and Quality
Treating Tobacco Use and Dependence: 2008 Update
https://www.healthypeople.gov/2020/topics-objectives/topic/tobacco-use-and-dependence
Section for clinicians and system decision makers, including systems change information for integration of tobacco dependence in clinical practice.

American Heart Association
Why Quit Smoking?
https://www.americanheart.org/en/healthy-lifestyle/quit-smoking-tobacco
Reviews reasons for quitting focused on heart disease, includes a “Cost of Smoking” calculator.

Centers for Disease Control and Prevention
Health Care Providers: How You Can Help Patients Quit
https://www.cdc.gov/tobacco/campaign/tips/providers/health/index.html
Provides general information for healthcare providers based on the Tips for Former Smokers® Campaign.

Centers for Disease Control and Prevention
Smoking and Heart Disease and Stroke
https://www.cdc.gov/tobacco/campaign/tips/diseases/heart-disease-stroke.html
Specific examples of the impact of smoking and exposure to secondhand smoke on heart disease and stroke, videos from the Tips campaign featuring real people with heart disease and stroke to promote motivation to quit.

University of Wisconsin- Center for Tobacco Research and Prevention
Providers Overview
https://ctri.wisc.edu/providers/providers-overview/
Offers tobacco treatment training through webinars, onsite videos, or online programs; updates on the evidence for electronic cigarettes, including vaping regulations by state.

Million Hearts
Tobacco Cessation Protocols
https://millionhearts.hhs.gov/tools-protocols/protocols.html TCP
Models for clinical decision making, including Implementation of the Tobacco Cessation Protocol, with performance feedback and implementation evaluation suggestions, and Protocol Example for Identifying and Treating Patients Who Use Tobacco, including ICD-10 Codes for Tobacco and Nicotine Dependence, and Secondhand Smoke Exposure.

North American Quitline Consortium
State telephone support lines for smoking cessation
http://www.naquitline.org/
Provides information about availability and details of telephone quitlines for smoking cessation across the United States, as well as electronic referral, other resources, and availability of nicotine replacement.

Rx for Change
Clinician-assisted tobacco cessation education
http://rforchange.ucsf.edu/
An online training program with a specific 1-hour module on cardiology and smoking cessation based on the Clinical Practice Guideline for Treating Tobacco Use and Dependence.

Smokefree partner toolkit
Smokefree.gov
https://smokefree.gov/help-others-quit/health-professionals
Provides comprehensive list of evidence-based resources, guides, and government reports aimed for clinicians, including smokefree mobile interventions.

Society for Research on Nicotine and Tobacco
Resources for Clinicians
https://www.smnt.org/page-Resources_Clinicians
Provides many science-based resources and a searchable index for abstracts related to cardiovascular disease.

American College of Cardiology
Stop Smoking
http://www.cardiosmart.org/Healthy-Living/Stop-Smoking
Provides information about smoking and heart disease, how to quit smoking, infographics and resources related to smoking cessation.

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**TABLE 13** Potential Participants in an Inpatient or Outpatient Smoking Cessation Program

<table>
<thead>
<tr>
<th>Participant*</th>
<th>Primary Roles</th>
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<tbody>
<tr>
<td>Medical director</td>
<td>Advocacy within the organization, addressing medical concerns regarding pharmacotherapy, engaging treating clinicians, limited training obligations. In some models, the medical director will prescribe smoking-related therapies. In other models, he or she will ensure that the treating physicians or advanced practice providers are equipped to do so.</td>
</tr>
<tr>
<td>Administrative leader: nurse, advanced practice provider, pharmacist, physician, hospital/clinic administrator</td>
<td>Program management, budget, daily/weekly process improvement leadership, engagement with informatics for reporting, reporting program successes and challenges to hospital leadership.</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>Reviewing medication safety concerns for order sets, care pathways, and individual cases; acting as a resource for clinician questions regarding dosage, effectiveness, or safety of medications; ensuring formulary alignment.</td>
</tr>
<tr>
<td>Counselor(s)-certified tobacco treatment specialists, nurses, social workers, advanced practice providers or physicians</td>
<td>Delivering motivational counseling, providing recommendations to treating clinicians on engagement in appropriate care pathways.</td>
</tr>
<tr>
<td>Tobacco treatment coordinators—medical assistants or health educators</td>
<td>Coordinating with medical director, counselors, clinicians, and pharmacists to provide education, conduct follow-up, and determine adherence.</td>
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</table>

*Small-scale programs can be initiated with part-time efforts by a physician and administrator only.
7. DISCUSSION AND IMPLICATION OF PATHWAY

The primary objective of this document is to provide a framework for the many decisions required in delivering smoking cessation therapy in clinical practice setting. No guideline, pathway, or algorithm should ever supersede clinical judgments. The effective provision of smoking cessation support to patients requires a team approach. Additionally, clinical practice guidelines evolve over time as new information appears. In this context, we have highlighted important literature citations explaining the rationale for treatment approaches and possible candidate best practices. With more evidence generated from ongoing research, refinement of this decision pathway will be needed. For now, the writing committee hopes that this decision pathway will help clinicians to improve the quality and effectiveness of the tobacco cessation strategies that they provide to their patients.

7.1. Key Points

- Tobacco use, especially cigarette smoking, is a major risk factor for CVD-associated morbidity and mortality. The reversible relationship between cigarette smoking and CVD provides a strong rationale for healthcare providers—especially the CV care team—to make the routine delivery of tobacco cessation treatment a standard component of CV care.
- Cigarette smoking is a chronic relapsing substance use disorder caused by addiction to nicotine. Most smokers pass through repeated cycles of short-term abstinence followed by relapse to smoking before achieving long-term tobacco abstinence. Treating tobacco dependence, therefore, requires clinicians to adopt a chronic disease management strategy, monitoring tobacco use over time and making repeated efforts to encourage and assist smokers to quit using tobacco.
- Current evidence strongly supports combining pharmacotherapy with behavioral/psychosocial interventions as the most effective way to help smokers sustain abstinence. Pharmacological therapies help smokers adjust to the absence of nicotine following cessation of smoking by lessening the symptoms of nicotine withdrawal. Behavioral and psychosocial treatments are based upon principles of behavioral and cognitive psychology that attempt to bolster smokers’ self-control over their smoking.
- Provider and system barriers in implementing and sustaining smoking cessation treatment need to be recognized and addressed to improve the smoking cessation care in the clinical setting.

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APPENDIX 1. AUTHOR RELATIONSHIPS WITH INDUSTRY AND OTHER ENTITIES (RELEVANT) — 2018 ACC EXPERT CONSENSUS DECISION PATHWAY ON TOBACCO CESSATION TREATMENT

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To avoid actual, potential, or perceived conflicts of interest that may arise as a result of industry relationships or personal interests among the writing committee, all members of the writing committee, as well as peer reviewers of the document, are asked to disclose all current healthcare-related relationships, including those existing 12 months before initiation of the writing effort. The ACC Task Force on Clinical Expert Consensus Documents reviews these disclosures to determine what companies make products (on market or in development) that pertain to the document under development. Based on this information, a writing committee is formed to include a majority of members with no relevant relationships with industry (RWI), led by a chair with no relevant RWI. RWI is reviewed on all conference calls and updated as changes occur. Author RWI pertinent to this document is disclosed in the table below and peer reviewer RWI is disclosed in Appendix 2. Additionally, to ensure complete transparency, authors’ comprehensive disclosure information—including RWI not pertinent to this document—is available online (see Online Appendix). Disclosure information for the ACC Task Force on Expert Consensus Decision Pathways is also available online, as is the ACC disclosure policy for document development.

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**Significant relationship.

NHLBI — National Heart, Lung, and Blood Institute; NIH — National Institutes of Health.

### APPENDIX 2. PEER REVIEWER INFORMATION—2018 ACC EXPERT CONSENSUS DECISION PATHWAY ON TOBACCO CESSATION TREATMENT

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ACC = American College of Cardiology; AHA = American Heart Association; BOG = Board of Governors; CV = cardiovascular; PCNA = Preventive Cardiovascular Nurses Association; UAB = University of Alabama at Birmingham; UCLA = University of California, Los Angeles; UT = University of Texas.

## APPENDIX 3. ABBREVIATIONS

- **ACC** = American College of Cardiology
- **ACS** = acute coronary syndrome
- **CHD** = coronary heart disease
- **CVD** = cardiovascular disease
- **ECDP** = Expert Consensus Decision Pathways
- **EHR** = electronic health record
- **FDA** = Food and Drug Administration
- **NRT** = nicotine replacement therapy
- **SHS** = secondhand smoke