

# The Impact of Smoking and Quitting Smoking on Patients With Diabetes

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## Abstract

Although cigarette smoking is the leading avoidable cause of death in the United States, its specific effects on people with diabetes are even more intricate and profound. Macrovascular and microvascular complications ensue more quickly in smokers with diabetes, and risk of mortality increases. The increased blood pressure and altered lipid profiles in smokers with diabetes could encourage development of the insulin resistance syndrome, setting patients up for further cardiovascular problems. Therefore, smoking cessation programs should be offered to the diabetic population. Such group programs can benefit from using behavioral change methods to devise specific strategies for smoking cessation and to prevent unique problems, such as postcessation weight gain and depression.

A variety of medications are available to clinicians advising smoking

cessation for patients with diabetes. Studies have not proven any one smoking cessation medication to be more effective than another, so the choice for pharmacotherapy depends on the unique needs of the individual. Bupropion may be a reasonable choice because of its use for depression and its ability to delay weight gain. However, many patients prefer the ease of use of certain nicotine replacement strategies. Clinicians may find combination strategies to be particularly useful.

Although further studies are needed for this special population regarding the impact on outcomes, providers should give cessation interventions high priority for diabetes control. This challenging population will need creative interventions to overcome their unique problems during smoking cessation, but the potential benefits may be considerable.

Approximately 434,000 deaths occur each year from smoking-related causes, which makes cigarette smoking the leading avoidable cause of death in the United States.<sup>1</sup> The prevalence of smoking among people with diabetes is similar to that in the general population, with smokers self-reporting use equally among patients with (27.4%) and without (25.9%) diabetes.<sup>2</sup> For smokers with diabetes, however, the complications incurred are not equal. All-cause mortality is increased in smokers with diabetes, and the risk of macrovascular and microvascular complications is also increased. Furthermore, smoking has been linked to worsening diabetes control and insulin resistance and may even induce diabetes.<sup>3</sup>

Along with elevated blood pressure, increased total cholesterol, and obesity, smoking is associated with

increased mortality in patients with diabetes. Smoking also serves as an independent risk factor for developing macrovascular complications, such as stroke and coronary artery disease.<sup>4</sup> Even when studies limit the influence of confounding factors, such as glycemic and blood pressure control, patients with diabetes who smoke are more likely to develop microvascular complications, especially nephropathy and neuropathy, faster. Specifically, both micro- and macroalbuminuria progress more rapidly in current smokers when compared to those who quit and those who never smoked.<sup>5</sup> Also, the incidence of neuropathy is 2.2 times higher in smokers versus nonsmokers.<sup>6</sup> Although future investigation should delineate exact relationships among diabetes complications, smoking, and smoking cessation, it is clear that providers should

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pay attention to the potential harm of nicotine use to the diabetic population.

### Characteristics of Smoking Cessation Programs

Certain characteristics are necessary for a smoking cessation program to give patients with or without diabetes the best possible chance to quit. Any practitioner on the health care team may provide counseling to quit smoking. Studies indicate that the type of professional providing counseling is less important than the fact that this message is delivered consistently over time, preferably by multiple health care providers. For example, primary care clinic physicians refer patients to the author's smoking cessation class. If patients do not wish to attend the class at that time, the physicians will approach them again at subsequent visits. Also, the dietitian and nurses will counsel patients to stop smoking at future visits and will also refer patients to the smoking cessation class. Thus, the message to stop smoking is delivered consistently and emphatically.

Because smoking is such a large part of smoking patients' life, programs that incorporate behavioral change techniques are beneficial. One helpful device for smoking cessation programs is to stratify patients according to their stage of behavioral change. The Transtheoretical Model, one such method of systematic behavioral change, has been used by smoking cessation clinics to stratify patients according to stages of precontemplation, contemplation, preparation, action, and maintenance.<sup>7</sup> Classifying smokers according to this model assists patients with progressing into a further stage of change. With regard to smoking and diabetes, this model can be modified and individualized to the specific needs of patients with diabetes, as outlined in Table 1.

Ruggiero et al.<sup>8</sup> applied this model of staged behavioral change to smokers with diabetes. Of 2,056 patients with diabetes, 57.8% responded by survey to questions that were consistent with placing them in the precontemplation stage. This stage indicated that these patients were not ready to stop smoking and had not attempted to quit within the past year. However, this study also revealed that diabetic patients who were given advice to quit smoking from their providers were

**Table 1. Stages of Behavioral Change: Applying the Transtheoretical Method to Smokers With Diabetes**

Stage	Characteristics	Appropriate Management
Precontemplation	Not ready to stop smoking; may not be aware of the harmful effects of smoking	Educate regarding increased risk of cardiovascular disease and micro- and macrovascular complications
Contemplation	Understands implications of continuing to smoke; will try to quit within 6 months but not within 30 days	Provide education and support regarding how to methodically approach the quit attempt; may be ready to enroll in a supportive class
Preparation	Plans to quit within the next 30 days	Provide targeted strategies to prepare the patient for the quit date
Action	Either has quit within the past month or is actively trying to quit	Provide cognitive, behavioral, and pharmacological strategies focused on controlling weight and preventing depression
Maintenance	Successfully quit for at least 30 days	Prevent relapses, focus on successes, and encourage healthy behaviors

further along in the stages of change. This underscores the previous assertion that advice from health care practitioners facilitates behavioral change in smokers with diabetes.

Even if it is not feasible to develop a formal smoking cessation program, patients will benefit from any counseling regardless of session length. This correlates to both the amount of time spent during the first contact with the patient and the number of successive visits tailored for smoking cessation. However, the percentage of patients who are able to quit smoking long term is directly proportional to the intensity of the intervention and the number of treatment sessions.<sup>4</sup> In a study comparing time spent with patients being discharged from a hospital, smokers were given either an intensive counseling session (30–60 minutes) or minimal counseling (10 minutes). Long-term smoking cessation rates were better in the intensively counseled group (29 vs. 20%) at 1 year.<sup>9</sup>

Although little research has centered on specific techniques that may be effective in the diabetic population, targeted techniques could be very effective. Teaching behavioral modification techniques, in addition to classifying patients according to their stage of behavioral change, has been successful in helping smokers quit. Behavioral modifications may be helpful for patients with diabetes because

of the overall need to implement this strategy concurrently for diabetes and smoking cessation.

Thus, patients with diabetes need to control their own environment. Because smokers should rid their homes of cigarettes and other smoking implements (i.e., ashtrays, lighters, matches) before the cessation attempt, patients with diabetes should be encouraged to extend that principle to snacking. Patients find that the temptation to light up is often unbearable right after their quit date and tend to give in to their cravings at that time. Recent quitters with diabetes are especially prone to slide back into their smoking habits once they begin to gain some weight. However, if smokers begin implementing behavioral changes before the quit date, they can handle both cigarette and snack cravings until they subside. Other specific behavioral strategies for this patient population are included in Table 2.

Likewise, patients actively quitting smoking should use cognitive strategies to help with cravings, such as continually reviewing their motivation to quit, distracting themselves during a craving, and using visualization. This last technique empowers patients in two aspects. They think about a situation in which they may be tempted to smoke, thus preparing themselves before an actual craving. For patients who are actively in the throes of a craving, the time taken to visualize

**Table 2. Strategies for Smokers With Diabetes**

**Behavioral Techniques**

- Cigarettes signal the end of a meal, so some former smokers tend to continue to eat after they are full. Patients should set an ending time to the meal before sitting down to eat and should push away from the table at that time regardless of whether they are through eating.
- An activity should be planned in advance for immediately after each meal, preferably one that incorporates exercise. Good suggestions are going for a walk, working in the garden, or continuing some large project, such as painting the rooms of the house most damaged from smoking.
- Because patients are no longer buying cigarettes at the store, why stop there? Encourage them to now begin a healthy lifestyle that includes a stockpile of fruits and vegetables. They should be trained to not allow themselves access to cigarettes for when the cravings occur, so this principle could be extended to include diet as well.

**Cognitive Techniques**

- Patients should control cravings by refocusing their thoughts before a craving leads to a slip. For example, when a recent quitter begins actively thinking about tobacco products or unhealthy snacks, he or she could be trained to think of the word “STOP” or snap a rubber band around the wrist. As the craving subsides, the patient could verbalize a reinforcing message, such as “I am in control of my actions.”
- Recent quitters should remind themselves when they wake up every day with a phrase such as “I made it through another day without smoking or eating unhealthily.”
- Through visualization, prepare for situations in which the temptation to smoke exists.

another situation may distract them for the length of time that the craving occurs. Table 2 includes examples of how cognitive strategies can be implemented dually for smoking cessation and better diabetes control.

**Post-cessation Weight Gain and Depression**

One of the biggest concerns for most patients undergoing a cessation attempt is the fear of withdrawal symptoms, including cravings, anxiety, irritability, sleep disturbances, increased hunger, and weight gain. The latter two symptoms are of particular concern for patients with diabetes. In the author’s smoking cessation clinic, recent quitters report a sudden increase in hunger, sometimes with subsequent weight gain. They commonly report that their senses of smell and taste are heightened right after quitting, and eating sometimes satisfies the oral fixation of cigarettes.

Haire-Joshu et al.<sup>10</sup> published a study that suggested that patients with diabetes may have preconceived notions regarding their smoking habits. The 64 patients with type 1 diabetes surveyed in the study stated that quitting would have negative effects on their ability to manage diabetes and suggested that cigarettes could be used as a modality for

hunger control. Weight gain in general can increase the risk of developing the insulin resistance syndrome.<sup>11</sup>

Patients who use smoking as an excuse to avoid weight gain are correct on one account: a modest weight gain may result from their smoking cessation attempt. Data were analyzed for the trends of weight gain and smoking cessation over a 10-year period in the Third National Health and Nutrition Examination Survey (NHANES).<sup>12</sup> With an average weight gain of 4.4 kg for men and 5.0 kg for women, smokers who had quit within the past 10 years were significantly more likely than nonsmokers to become overweight. However, only a minority of patients who stop smoking experience major weight gain. In the NHANES study, only 16% of men and 21% of the women gained 15 kg or more. Regardless of the comparatively small numbers of patients who gain weight, this fear alone can hinder many patients’ quit attempts.

The effects of cigarette smoking and cessation on risk of developing diabetes was explored in a study by Wannamethee et al.<sup>13</sup> For patients who previously did not have diabetes, weight gain increased the risk of developing type 2 diabetes during the first 5 years after smoking cessation. However, this study also found a

reduction in overall risk of diabetes in the long term when compared to those who continued to smoke, even though the smokers had a lower average body weight. Furthermore, the U.S. Nurses Health Study<sup>14</sup> suggested that women who smoked > 25 cigarettes per day had a 1.42 times increased risk of developing diabetes than nonsmokers. Smoking may alter fat distribution and lead to the development of diabetes, whereas cessation improves the lipid profile (decreases triglycerides levels) and increases insulin sensitivity. Thus, the overall risk of developing diabetes in the short term after modest weight gain associated with smoking cessation is clearly outweighed by other metabolic benefits.

Even if patients with diabetes continue to smoke in order to prevent weight gain, this is an ineffective plan from a mortality standpoint. An international cohort study<sup>15</sup> of 4,427 patients with diabetes compared mortality risks of smokers versus quitters. The mortality risk was inversely proportional to the number of years since patients with diabetes quit smoking (a relative risk of 1.53 and 1.25 for 1– and ≥ 10 years, respectively). Thus, the increased mortality risk for smokers with diabetes begins to decrease over time.

The prevalence of depression is much higher in the diabetic population than in the general population (estimated at 14 vs. 3–4%, respectively).<sup>16</sup> However, only a few studies correlate the extent of the association between smokers in the diabetic population and depression. One such study<sup>17</sup> was a survey of 4,385 patients with diabetes to assess factors that could lead to major depression. The independent risk factors most likely to be associated with depression in this patient population included smoking, clinical obesity, treatment with insulin, and higher hemoglobin A<sub>1c</sub> (A1C) levels in patients < 65 years of age. In another study,<sup>18</sup> the number of cigarettes smoked correlated with the level of depression in the diabetic population.

Clinicians who provide smoking cessation counseling for patients with diabetes should be cognizant of post-cessation weight gain and depression. Providers may be tempted to suggest strict dieting while patients are in the process of cessation. However, patients who modify one adverse

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behavior at a time (i.e., smoking cessation) are more likely to succeed than those who attempt to change several behaviors at once. Thus, clinicians should help patients develop a healthy diet and meal plan and emphasize physical activity with an exercise program. Exercising in response to cigarette cravings is a healthy alternative to suffering silently through each craving. Other suggestions for combating postcessation weight gain and depression are given in Table 3. Patients with diabetes who are concerned about modest weight gain should remember that the worst cigarette and food cravings are only temporary and will subside with time. Additionally, even a modest weight gain in the short term postcessation is offset by the long-term health benefits.

### Smoking and Insulin Resistance

Smoking does not affect the plasma concentrations of oral diabetes medications such as sulfonylureas and thiazolidinediones. However, the most profound impact of smoking in diabetic patients is on insulin sensitivity. Smoking decreases subcutaneous absorption of insulin, resulting in increased dosing requirements. When the action of insulin is impaired chronically in smokers, a dose-response relationship can be seen between the number of cigarettes smoked and the degree of insulin

resistance.<sup>19</sup> The differences in insulin sensitivity may be caused by the direct effects of nicotine, carbon monoxide, or other chemicals in tobacco smoke. These factors also may alter the pathogenesis of early steps in insulin action, such as signal transduction or glucose transport. Furthermore, higher plasma triglycerides, lower HDL cholesterol, higher plasma insulin levels, and elevated systolic blood pressure levels are all typical findings in smokers and characterize the insulin resistance syndrome. Thus, smoking in patients with diabetes seems to bring out attributes of the insulin resistance syndrome, serving as a link between the use of cigarettes and cardiovascular disease.<sup>20</sup>

### Pharmacotherapy for Smoking Cessation

A variety of pharmacotherapies for a smoking cessation attempt are available, including nicotine replacement therapies such as the nicotine patch, gum, lozenge, nasal spray, and inhaler. Also, the antidepressant bupropion is a good nonnicotine alternative and is especially promising in the diabetic population. Because most of the medications are available without prescription, a smoker's first attempt at cessation is most likely to be self-propagated. Unfortunately, most patients do not seek advice from their primary provider before their

attempt. Therefore, it is incumbent on all members of the health care team to learn how to counsel smokers about cessation pharmacotherapy.

The good news is that all pharmacotherapies will significantly enhance patients' chances of succeeding when compared to cessation counseling alone. Although none of the medications are particularly advantageous regarding rates of cessation, each is approximately twice as effective compared to counseling alone. The particular medication chosen should be tailored to the individual patient's needs. Some advantages and disadvantages of each medication are outlined in Table 4.

The bad news is that none of the smoking cessation medications have been studied specifically in the diabetic population. Therefore, the literature does not suggest that any particular cessation medication has enhanced efficacy. Patients with diabetes have been included as a subpopulation in many studies, however, and extrapolations regarding the usefulness of particular medications can be made. For example, medications that attenuate the special issues of weight management and depression in this population may be useful.

As mentioned earlier, patients with diabetes tend to suffer from depression more than those in the general population. Depression and other psychiatric conditions also contribute to a greater prevalence of smoking and increase the risk of relapse after cessation.<sup>3</sup> Therefore, bupropion may be an excellent choice for smoking patients with diabetes, especially because it also can delay and attenuate weight gain.<sup>21</sup> With respect to the issue of depression, other medications, such as selective serotonin reuptake inhibitors (SSRIs) and the tricyclic antidepressant nortriptyline have been studied for smoking cessation with modest results. However, SSRIs and tricyclic antidepressants currently are not recommended for first-line therapy and have not been studied specifically in diabetic patients for the purpose of smoking cessation.

One last medication deserves mention. Rimonabant is a promising new smoking cessation medication for this population because of its unique additional effect of causing weight loss. It is the first of a new class of agents—selective cannabinoid receptor antago-

**Table 3. Strategies for Postcessation Weight Gain and Depression**

- Do not encourage patients to begin a very prohibitive diet at this time. The goal during the fragile period after the quit date is weight control, but not necessarily weight loss. The confidence gained through a successful cessation attempt may increase the likelihood that patients will set progressive goals for themselves regarding weight loss.
- Carrots and celery sticks could be helpful for dealing with the hand-to-mouth routine that smokers develop. Fresh vegetables, pretzels, and other reasonably healthy snack foods could be stored for quick access whenever quitters experience cravings.
- Recommend a plan to increase physical activity above baseline, specifically designed to accommodate patients' interests.
- Encourage patients to eat a healthy diet, plan meals in advance, increase water consumption, and snack only on sugar-free products (but preferably fruits and vegetables).
- Quitters should reward themselves for this accomplishment. However, it is especially important for patients with diabetes to select nonfood rewards.
- Enlist the support of all family members, coworkers, and friends. If a spouse or family member is serious about quitting, they should attend smoking cessation programs together.
- Forming a buddy system can be helpful. Recent quitters can be instructed to contact their buddy if a craving is particularly strong and may lead to a slip.
- Alcoholics Anonymous espouses the HALT mnemonic, which is helpful for any behavioral modification program. The phrase means "don't get too Hungry, Angry, Lonely, or Tired," all triggers for drinking, smoking, and unhealthy snacking.

**Table 4. FDA-Approved Smoking Cessation Medications**

Method	Advantages	Disadvantages
Nicotine patch	<ul style="list-style-type: none"> <li>• Easy for patients to use; fewer compliance issues</li> <li>• Can be obtained without a prescription</li> <li>• Patient receives more consistent nicotine levels throughout the day to alleviate continuous cravings</li> <li>• “Step down” therapy allows patients to receive decreasing levels of nicotine every few weeks</li> </ul>	<ul style="list-style-type: none"> <li>• Many patients experience pruritis as allergic reaction to adhesive used and may have to use another brand</li> <li>• Must avoid use in patients with dermatological conditions (i.e., eczema, dermatitis, psoriasis)</li> </ul>
Nicotine gum/lozenge	<ul style="list-style-type: none"> <li>• Adjustable use; should follow a specific schedule for use but can use for “breakthrough cravings”</li> <li>• Good for adjunct therapy with with a longer-acting medication, such as patch or oral medication</li> <li>• Can be obtained without prescription</li> <li>• “Step down” therapy allows the patients to receive decreasing levels of nicotine every few weeks</li> <li>• Gum use may delay weight gain</li> </ul>	<ul style="list-style-type: none"> <li>• Proper chewing technique must be used to decrease adverse effects (lozenge is a little easier to use)</li> <li>• Cannot be used by denture wearers</li> <li>• Cannot use acidic beverages (orange juice, colas) for 15 minutes before or while using gum/lozenge</li> <li>• Adverse effects are mainly gastrointestinal: nausea, hiccups, and heartburn</li> </ul>
Nicotine inhaler	<ul style="list-style-type: none"> <li>• Adjustable use; should follow a specific schedule for use but can use for “breakthrough cravings”</li> <li>• Great choice for patients who cannot seem to get past the hand-to-mouth” ritual of smoking</li> <li>• Provides “step down” therapy, although dosing is not as strict</li> </ul>	<ul style="list-style-type: none"> <li>• Obtained by prescription only</li> <li>• Patient could become dependent</li> <li>• Initial throat or mouth irritation</li> <li>• Cannot be used by patients with severe reactive airway</li> <li>• Patients should avoid eating or drinking within 15 minutes of using inhaler</li> </ul>
Nicotine nasal spray	<ul style="list-style-type: none"> <li>• Adjustable use; should follow a specific schedule for use but can use for “breakthrough cravings”</li> <li>• Provides “step down” therapy, although dosing is not as strict</li> </ul>	<ul style="list-style-type: none"> <li>• Obtained by prescription only</li> <li>• Patients could become dependent</li> <li>• Potential for mouth/throat irritation is significant</li> <li>• Patients with severe reactive airway diseases should avoid using spray</li> </ul>
Bupropion SR	<ul style="list-style-type: none"> <li>• The only nonnicotine medication available at this time</li> <li>• Easy to use: twice daily by mouth</li> <li>• Good choice for combination nicotine-replacement therapy</li> <li>• May delay weight gain</li> <li>• Can also be used for depression</li> </ul>	<ul style="list-style-type: none"> <li>• Obtained by prescription only</li> <li>• Timing may be an issue: must begin using for at least 1 week before quit date</li> <li>• Should be avoided in patients with high seizure risk (seizure history, anorexia, some medications)</li> </ul>

nists—that, among other activities, are believed to alter central action on lipid and glucose metabolism and nicotine dependence. Although rimonabant had not received Food and Drug Administration (FDA) approval at the time of this writing, preliminary controlled trials revealed that 20 mg

per day for 10 weeks with follow-up after 42 weeks induced a 36.2% smoking cessation rate versus 20.6% with placebo.<sup>22</sup> In the same study, the weight change for rimonabant versus placebo was a 0.3 kg weight loss and a 1.1 kg weight gain, respectively. Results of another study are more

encouraging for the weight loss action. That trial revealed that weight loss at 1 year with the 20-mg dose yielded a reduction of 6.6 versus 1.8 kg in the placebo group.<sup>23</sup>

**Combination Therapy for Smoking Cessation**

Patients with diabetes who smoke may represent a population more resistant to standard smoking cessation techniques. Therefore, treatment paradigms may need to be more aggressive. It is reasonable to hypothesize that smoking cessation products may be more effective when used in combination treatment for this patient population, although literature to confirm this point is lacking.

There are two types of combination treatment: combined use of nicotine replacement therapy products and use of the nicotine patch in combination with bupropion. Although both the nicotine patch and gum can be used separately with success, studies have shown that using the patch for consistent, long-term therapy with the gum for breakthrough cravings is more effective than either form alone. For example, a review of four studies showed that either the 16-hour or 24-hour transdermal patch plus up to seven pieces of gum per day increased the cessation rate and decreased the amount of withdrawal experienced when compared to either product alone.<sup>24</sup> Studies that combine a nicotine patch with a multiple-dosing nicotine replacement therapy, such as the nasal spray and inhaler, have produced similar results.

The nicotine patch plus bupropion also seems to be more effective than using the patch alone. In a study by Jorenby et al.,<sup>21</sup> 12-month abstinence rates for patients receiving placebo, nicotine patch, bupropion, and combination therapy were 15.6, 16.4, 30.3, and 35.5%, respectively. In this study, the abstinence rate for combination therapy was significantly better than that for the nicotine patch alone. Interestingly, there was no difference in efficacy between combination therapy and bupropion alone. However, both medications offer advantages for patients. The nicotine patch is a preferred method of nicotine delivery for some patients because of its easy administration, and bupropion delays and attenuates

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weight gain, as mentioned previously. Finally, the recommended length of a complete treatment period for patients on combination therapy is 3–6 months.<sup>25</sup> This length of time is greater than monotherapy with either the nicotine patch or bupropion, which is a total of 10 weeks for step-down therapy or 7–12 weeks, respectively.

### Outcomes Measures for Patients With Diabetes After Smoking Cessation

The importance of focusing on diabetic patients who smoke with individualized interventions cannot be overemphasized. As mentioned earlier, these patients are at increased risk for mortality and for developing cardiovascular and microvascular complications. Furthermore, reducing blood pressure and cholesterol are nonglycemic ways of attenuating the cardiovascular complications of diabetes. This was suggested by subanalyses of the U.K. Prospective Diabetes Study and the Scandinavian Simvastatin Survival Study, which reduced blood pressure and cholesterol levels, respectively.<sup>26,27</sup> Thus, smoking cessation should yield additional benefits in this population.

Also, factors inherent with this patient population inhibit the chances of successfully quitting. Smokers with diabetes are more likely to report that their health is in worse condition and that they participate less in self-care management activities than their nonsmoking counterparts. For example, respondents with diabetes to a questionnaire by Solberg et al.<sup>3</sup> were less likely to check their blood glucose levels or visit their physicians for diabetes and A1C tests. They also engaged in less physical activity than their nonsmoking counterparts. Conversely, this group of patients were more likely to report that their health was poorer and that they often had feelings of being depressed.

Smoking cessation in the general population benefits economic, clinical, and humanistic outcomes. However, the literature has not focused on the potential long-term impact of smoking cessation in the diabetic population. Possible economic gains include money saved through having fewer overall health care costs. Patients save money by not perpetuating the addiction. The humanistic impact includes a greater sense of control over one's

own health. Clinical measures include the following potential outcomes: attenuation of depression, decreased blood pressure and triglyceride levels, and enhanced glycemic control. Unfortunately, the literature is lacking for such well-constructed studies in the diabetic population. Additionally, smoking is a modifiable cardiovascular risk factor, cessation of which, along with reducing blood pressure and cholesterol levels, could result in a reduction of morbidity and mortality in this patient population. In fact, focusing on the risk management parameters of cardiovascular disease may reduce morbidity and mortality more than tightening glycemic control, as suggested by the results of several recent studies.<sup>26,28,29</sup>

### Practical Clinical Recommendations and Conclusions

Identifying smokers and providing support for their smoking cessation attempts is clearly effective. Creative methods, such as elevation of smoking status to that of a vital sign, have been devised to remind clinicians how important this is. Identifying smokers in the diabetic population and providing them with counseling is even more crucial. However, clinician counseling of patients regarding smoking cessation is still less than optimal.<sup>30</sup> Furthermore, merely identifying and documenting patients who smoke will not lead to overall reductions in smoking and its related complications.<sup>31</sup> Such mechanisms must include follow-up for patients with diabetes who are interested in smoking cessation. This important follow-up is best implemented in a group program that provides behavioral, cognitive, and pharmacological assistance.

For clinicians who take care of diabetic patients, identifying and providing smoking cessation interventions should be of the highest priority in diabetes control. Diabetes care providers should advise their patients who smoke to stop, and preferably this should be repeated annually. Although not all smokers may be ready to stop at a particular time, clinicians should provide brief counseling about the risks of smoking and benefits of quitting. Regarding the Transtheoretical Model, patients who present in a certain stage could receive stage-matched interventions to move them into the next readiness stage.<sup>3</sup>

For those who are ready to quit, smoking cessation medication should be provided with specific follow-up care or referral to a cessation clinic. Practical counseling on behavioral and cognitive techniques could be provided during follow-up care. Patients who attend smoking cessation clinics and receive cessation medications are most likely to quit smoking. Although no particular medication can be recommended as superior for the diabetic population, consideration of combination therapy is warranted, especially for patients who are heavy smokers with a history of multiple quit attempts.

Special issues during a cessation attempt in this population include attention to weight gain and development of depression. Tailoring of cessation medications and counseling for weight gain prevention and consideration of pharmacotherapy for depression may be needed.<sup>4</sup> Also, this patient population may be more non-adherent and may need close management and follow-up if they fail to appear at their scheduled visits. Finally, clinicians should consider smoking cessation as equally important to blood pressure and cholesterol control as methods of attenuating cardiovascular complications of diabetes.

In conclusion, patients with diabetes who smoke represent a population that could potentially benefit even more than their nondiabetic counterparts from cessation programs. These smoking cessation programs should be implemented with a focus on specific cognitive, behavioral, and pharmacological therapies that control weight and prevent depression. The outcomes benefits have not been studied extensively in this population. However, smokers with diabetes represent a clinical challenge and could benefit from creative and specific interventions for cessation.

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