

# Promoting Tobacco Cessation During Substance Abuse Treatment

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Through a retrospective medical record review that includes naturalistic observation data, researchers attempt to determine whether nicotine addiction can be addressed successfully during treatment for nonnicotine substance use disorders.

In 2007, the prevalence of cigarette smoking among adults in the United States dropped below 20% for the first time since the 1964 publication of the Surgeon General's report on the hazards of smoking.<sup>1,2</sup> Although that statistic represents a continuing decline in cigarette smoking among all sociodemographic groups in the United States, cigarette smoking among individuals with a substance use disorder (SUD) is 3 to 4 times that of the general population,<sup>3,4</sup> and, in 1 treatment sample, was reported to be as high as 92%.<sup>5</sup>

Despite the pervasiveness of smoking among patients with SUDs, and the fact that more smokers with alcoholism die from tobacco-related illnesses than from alcohol consumption,<sup>6</sup> few SUD treatment programs routinely provide concomitant tobacco cessation services.<sup>7</sup> Nonetheless, a growing body of evidence supports integrated intervention for tobacco dependence and nonnicotine SUDs,<sup>8,9</sup> including the most recent Health and Human Services Clinical Practice Guideline on treating tobacco use and dependence.<sup>10</sup> Like-

wise, most providers favor incorporating tobacco cessation interventions into SUD treatment programs<sup>11</sup>; unfortunately, many providers lack confidence in their ability to influence patients' tobacco usage.<sup>12</sup>

Studies addressing readiness to quit smoking among patients in treatment for an SUD have offered little or no evidence that demographic factors, psychiatric status, self-reported nicotine dependence, or number of cigarettes smoked per day have predictive value. Self-efficacy has not yet been fully explored as a potential correlate of change in patients with SUDs, and there is a dearth of qualitative research incorporating patients' self-identified motivators for and obstacles to quitting tobacco usage. Studies have demonstrated, however, that there is a strong relationship between the length of abstinence from alcohol and success in smoking cessation.<sup>9,13</sup> Furthermore, maintenance after SUD recovery is greater among patients who address nicotine addiction.<sup>9,13</sup> Together, these findings suggest that recovery from nicotine addiction and other SUDs go hand-in-hand.

This study sought to determine whether patients enrolled in an intensive SUD treatment program that included 3 brief tobacco cessation motivational interventions, as well as weekly nicotine recovery education classes and medical treatment for tobacco cessation, were ready and

able to reduce or stop their tobacco usage during the course of SUD treatment. We identified positive steps the patients were able to take toward tobacco cessation, explored the relationships between their tobacco usage and self-reported motivators for and obstacles to quitting, and assessed both their readiness to quit using tobacco and their perceived self-efficacy for quitting.

Although we expected few patients to stop using tobacco during the 3- to 6-week outpatient program, we hypothesized that their readiness to quit and perceived self-efficacy would increase and that their tobacco usage would decline substantially. We designed the study to allow patients to use their own words to provide perspective on the reasons for and barriers to changing tobacco usage that, until now, may have been missing in the literature on nicotine recovery.

## METHODS

### Participants

Our study included 116 U.S. Military veterans who were admitted to an intensive outpatient program (IOP) at a large southeastern VA medical center for treatment of nonnicotine SUDs. The typical length of stay in the IOP was 3 weeks for patients whose treatment was focused mainly on their SUD diagnosis, and 6 weeks for patients who needed extended treat-

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ment for an SUD as well as a serious, concurrent psychiatric diagnosis. In this study sample, most participants (75%) were enrolled in the 3-week program. For participants who required placement in contracted housing to complete the IOP (87%), the treatment program provided accommodations in a community halfway house. Participants were predominantly male (94%) with a mean age of 49.5 (SD, 10.22) years. The majority (62%) of the patients were white, 29% were black, and 9% were Hispanic.

Most patients were seeking non-nicotine SUD treatment and met *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition*, criteria for abuse of or dependence on 1 or more substances. Over two-thirds of the sample (n = 71; 69%) met criteria for more than 1 nonnicotine SUD. Most of the sample met criteria for an alcohol use disorder (n = 103; 89%); 35 patients had only an alcohol use disorder and no other SUD. The next most common substance diagnosis was for cocaine (n = 54; 47%); 6 patients had only a cocaine use disorder and no other SUD. Cannabis was the next most common SUD (n = 32; 28%); there were no patients with a cannabis use disorder alone. Fourteen percent (n = 17) had an opioid use disorder, and only 3 patients presented with an opioid use problem alone. Three percent (n = 4) had an amphetamine use disorder, and only 1 patient had an amphetamine use disorder and no other SUD. About 3% (n = 3) had a sedative use disorder, and all of those patients also had some other SUD. Only 4 patients had more than 1 nonalcohol SUD; 2 of those individuals were being treated for concurrent cocaine and marijuana use disorders, 1 was being treated for cocaine and opioids, and 1 was being treated for cocaine, marijuana, and opioids.

Most patients (n = 82; 71%) had a comorbid psychiatric condition, and 19% of the sample (n = 22) had more than 1 psychiatric diagnosis. The most common diagnosis was depression (n = 36); 22 of the patients had depression alone and no other psychiatric diagnosis. The next most common psychiatric diagnosis was posttraumatic stress disorder (PTSD) (n = 17); 9 patients had PTSD and no other concurrent psychiatric diagnosis. Seventeen patients had some other anxiety disorder; 7 of them had some other anxiety disorder and no other psychiatric diagnosis. Bipolar disorder was diagnosed in 12 patients; 9 of them had bipolar disorder alone. Nine patients had some psychotic disorder; 6 of them had no other additional psychiatric diagnosis. Six patients had a mood disorder; 3 of them had no other psychiatric disorder. Adjustment disorder was diagnosed in 3 patients; 2 of them had that disorder alone. A cognitive disorder was diagnosed in 2 patients; 1 had that disorder alone. Attention deficit hyperactivity disorder was diagnosed in 1 patient and that individual had no other psychiatric disorder. Borderline personality disorder was diagnosed in 1 patient and that individual also had other psychiatric disorders.

Of the 85 patients who were tobacco users at intake, 45 patients (53%) had at least 1 smoking-related illness (such as hypertension, chronic obstructive pulmonary disease, or coronary artery disease) listed in their medical record, for which, they were receiving medical treatment and follow-up. Notably, of the 5 patients who were using smokeless tobacco exclusively upon intake, only 1 patient was being followed for a smoking-related illness and that individual reported a history of cigarette smoking.

## Design and procedure

In conducting this retrospective medical record review, we examined naturalistic observation data that had been collected primarily by the lead author (a clinical psychologist) as well as psychiatrists, nurse practitioners, and counselors, on 116 patients successively admitted into an IOP for treatment of a nonnicotine SUD. All patients, regardless of tobacco usage, received 3 brief motivational interventions for tobacco cessation conducted primarily by the lead author as well as other members of the treatment program staff, including psychiatrists, a nurse practitioner, and counselors, at the beginning, midpoint, and end of the IOP. During each session, patients were assessed for tobacco use, self-efficacy, and, if applicable, readiness to quit, as well as motivators for and obstacles to quitting.

Tobacco users were encouraged to quit using tobacco and were educated about available tobacco cessation aids, such as nicotine replacement therapy and smoking cessation clinics. With patients who had never used or had stopped using tobacco, the clinician discussed potential triggers to tobacco use and strategies for avoiding exposure to secondhand smoke. Each of the 3 intervention sessions was 10 to 15 minutes in length. In addition, all patients, regardless of tobacco use status, attended weekly nicotine recovery education classes, as part of the regular clinic programming, and tobacco users were offered such medical treatment as nicotine replacement therapy or other pharmacotherapy to aid in tobacco cessation.

## Measures

**Tobacco use.** Patients provided verbal self-reports regarding their tobacco status and current quantity of use. Self-report of tobacco usage has

been shown to be both sensitive and specific.<sup>14</sup>

**Fagerström Test for Nicotine Dependence (FTND).**<sup>15</sup> The FTND identifies relative levels of nicotine dependence on a scale of 0 to 10—a higher score indicating a greater level of dependence.

**Motivators for and obstacles to quitting tobacco usage.** Clinicians conducted semi-structured, open-response interviews to document motivators for and obstacles to quitting. To limit the quantity of responses, patients were asked to provide their top 5 reasons for wanting to quit using tobacco and their top 5 obstacles to quitting.

**Readiness to Quit Ladder.**<sup>16</sup> The Readiness to Quit Ladder is a 10-point scale that provides anchored response options, ranging from having no interest at all in quitting smoking to having already quit smoking. A higher score on this scale indicates greater motivation to quit smoking.

**Self-efficacy.** As a measure of self-efficacy, patients were asked to respond to the question, “How confident are you that you would be able to quit smoking or using tobacco if you tried?” Responses were provided on a 5-point Likert scale, ranging from 0 (not confident at all) to 4 (extremely confident).

## RESULTS

Student *t* tests revealed that there were no differences in number of cigarettes smoked based on length of stay or on intake measures of nicotine dependence (FTND score), readiness to quit, or self-efficacy. Some attrition occurred during the IOP, but tobacco users who started and did not complete the program (*n* = 12) did not differ significantly from IOP completers in terms of the number of cigarettes smoked or intake measures of readiness to quit or self-efficacy

for quitting. Completers, however, tended to have higher FTND scores than noncompleters, though the difference was not significant ( $P < .06$ ).

### Tobacco use

At intake, 85 (73%) of the patients used tobacco products, primarily cigarettes. Only 5 patients were using smokeless tobacco exclusively upon intake, and 2 of those individuals had a history of cigarette smoking as well. One patient reported that he smoked 3 cigars per day and no cigarettes, though he had a history of cigarette smoking. The tobacco-using patients reported that they had used tobacco for an average of 31 years, and the cigarette smokers reported that they smoked an average of 19 cigarettes per day. Of the 5 patients who used smokeless tobacco exclusively, they reported that they used it an average of 6 days per week. For cigarette smokers, the mean FTND score at intake was 5.66 (SD, 2.70), indicating a moderate level of dependence and closely resembling the mean FTND scores of a similar sample of patients seeking SUD treatment.<sup>17</sup>

Only 2 patients stopped using tobacco while enrolled in the IOP; another 4 resumed a previous smoking habit during treatment. The 2 patients who quit were smoking 10 cigarettes per day at intake; 1 had been a smoker for 18 years and the other for 45 years. The 4 patients who resumed smoking during SUD treatment had, on average, smoked 25 cigarettes per day and had quit for 2 months prior to enrolling in the IOP. They reported that they had been smokers from anywhere between 2 to 48 years in their lives, with a mean of 26 years.

At midpoint, 77 (73%) of the 105 patients who remained in the IOP used tobacco and, at discharge, of the 97 remaining patients, 71 (73%) used tobacco.

### Readiness to quit

At intake, the Readiness to Quit Ladder<sup>16</sup> indicated that 43 (51%) of the 85 tobacco users in the sample planned to quit using tobacco within 6 months, and 32 (38%) reported that they planned to quit within 30 days. At discharge, 51 (72%) of 71 tobacco users reported that they planned to quit within 6 months, and 41 (58%) reported that they planned to quit within 30 days. At intake, patients' mean self-efficacy rating with regard to quitting tobacco use was “moderate,” and this figure did not change throughout the study.

Repeated analysis of variance revealed that, over the course of treatment, patients' mean readiness to quit smoking, as measured by the Readiness to Quit Ladder,<sup>16</sup> increased significantly [ $F(2, 172) = 3.41$ ;  $P < .035$ ] (Figure 1). We conducted paired-sample *t* tests to determine mean differences between the 3 intervention time points. After a Bonferroni correction, the difference between intake and discharge means remained significant ( $P < .017$ ).

### Correlates of change in smoking behavior

Patients who smoked cigarettes significantly decreased their cigarette use over the course of the IOP [ $F(2, 130) = 15.02$ ;  $P < .000$ ]. Pairwise comparisons revealed that differences between the means, both at intake and midpoint and at intake and discharge, remained significant after a Bonferroni correction ( $P < .017$ ). On average, by the end of treatment, patients had reduced their cigarette use by nearly 6 cigarettes per day—from 19 to 13.2 (Figure 2).

Controlling for the effects of nicotine dependence, as measured by the FTND, we used correlation and partial correlation coefficients to analyze the relationship between

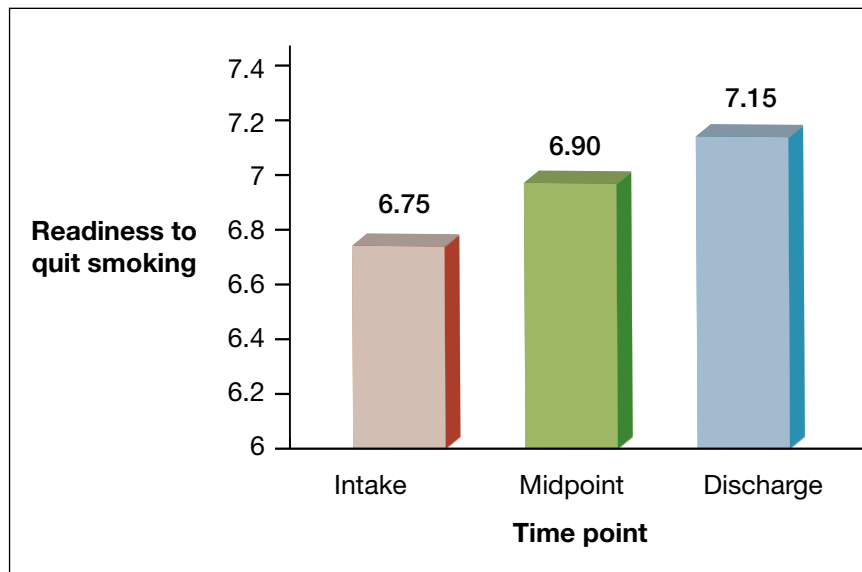


Figure 1. Patients' mean readiness to quit smoking scores, as measured by the Readiness to Quit Ladder,<sup>16</sup> at the 3 intervention time points.

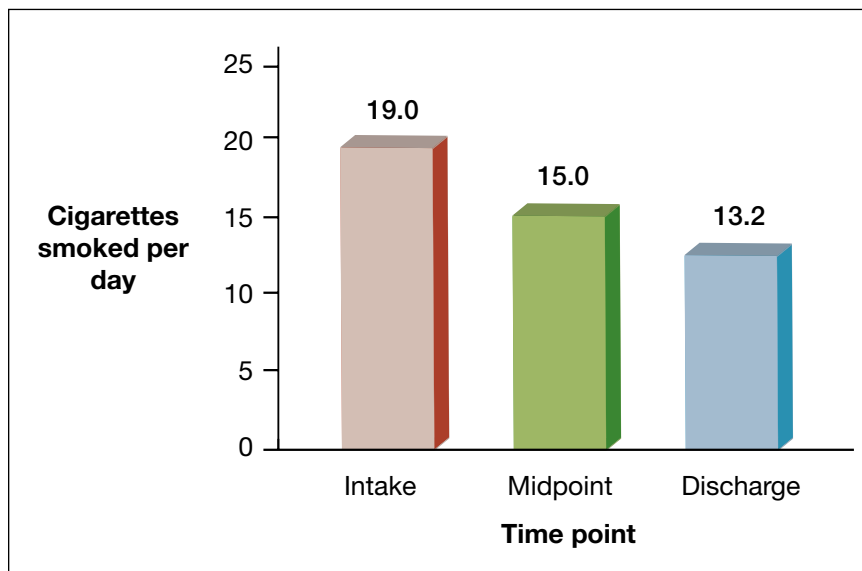


Figure 2. Patients' mean cigarette use, as indicated by self-report, at the 3 intervention time points.

study measures at the 3 intervention time points and change in tobacco usage over the course of treatment, as well as change in readiness to quit from intake to discharge (Table 1). We found no significant correlation

between change in tobacco usage during the program and either the number of motivators or obstacles reported at any of the 3 intervention time points or readiness to quit or self-efficacy for quitting at intake

and midpoint. We did, however, find that change in tobacco usage was positively and significantly associated with readiness to quit at discharge, self-efficacy for quitting at discharge, and change in readiness to quit from intake to discharge, when we controlled for FTND.

### Motivators for and obstacles to quitting tobacco use

At all 3 intervention time points, the most commonly identified motivator for quitting tobacco use could be categorized as “health,” a term we used to encompass responses that pertained to physical ailments, such as difficulty breathing or coughing, fear of disease, or a desire to live longer. The proportion of patients responding that they were motivated to quit for health reasons remained at or near 90% throughout the IOP.

The second and third most common motivators could be categorized as a desire to “save money” and the perception that smoking “smells or tastes bad.” By discharge, the proportion of participants citing these as motivators increased by 12% and 11%, respectively. The category of “family” included such responses as “my family wants me to quit,” and “I’d like to set a good example for my children.” The category of “stigma” included responses pertaining to the negative social consequences of being identified as a smoker, such as “other people don’t like it,” or “it’s unattractive.” Response ranking remained fairly stable over the course of treatment (Table 2).

Throughout the IOP, the ranking of the top 5 obstacles to quitting tobacco use shifted more than the ranking of motivators, though “being around others who smoke” and “stress” were consistently the 2 most popular responses for obstacles to quitting smoking (Table 3). “Stress”

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remained a fairly stable obstacle to quitting tobacco use throughout the treatment program, but, by discharge, the obstacle of “being around others who smoke” went from 47% to 56% of participant responses. “Daily habit,” which referred to such habitual aspects of smoking as smoking after meals, after waking, while driving, or while talking on the phone, also increased from 20% to 31% of participant responses by discharge.

**DISCUSSION**

It is important to bear in mind that our sample was not a selected group of individuals requesting tobacco cessation and, therefore, cannot be compared to a tobacco cessation group, in which, abstinence rates after 3 weeks would be expected to be much higher. The majority of our participants had dual diagnoses and multiple addictions. At intake and throughout the treatment program, nearly 75% of them used tobacco, which is more than 3.5 times the rate of smoking in the general population.<sup>1</sup> Despite their clinical complexity and the fact that they were not specifically seeking tobacco cessation services, these patients were able to significantly increase their readiness to quit tobacco use—from 38% to 58%—over the course of a 3- to 6-week IOP.

At intake, about half of the patients said they had no plans to quit using tobacco, but, by discharge, almost 75% had plans to quit in the future. Although, on the whole, their self-efficacy did not increase, participants were able to make significant progress in reducing their cigarette consumption throughout the course of the IOP. This is a promising finding in light of the fact that decreasing cigarette usage has been found to increase the likelihood that a smoker will quit in the future.<sup>18</sup>

**Table 1. Correlations and partial correlations between study measures and change in tobacco use, controlling for FTND**

Variable	$\bar{x}$	SD	<i>r</i>	<i>pr</i>
<b>No. of motivators</b>				
intake	3.05	1.31	0.20	0.16
midpoint	3.17	1.30	0.17	0.15
discharge	3.40	1.33	0.20	0.20
<b>No. of obstacles</b>				
intake	2.67	1.22	0.10	-0.12
midpoint	2.60	1.18	0.07	0.07
discharge	2.54	1.32	-0.08	-0.13
<b>Readiness to quit</b>				
intake	6.75	2.25	0.04	0.10
midpoint	6.90	2.40	0.23	0.17
discharge	7.15	2.09	0.44 <sup>a</sup>	0.34 <sup>b</sup>
Change in readiness	0.68	1.46	0.47 <sup>a</sup>	0.49 <sup>a</sup>
<b>Self-efficacy</b>				
intake	2.22	1.15	-0.10	-0.01
midpoint	2.31	1.12	0.13	0.21
discharge	2.27	1.1	0.24 <sup>c</sup>	0.38 <sup>b</sup>
FTND	5.66	2.70	0.19	-

FTND = Fagerström Test for Nicotine Dependence; *pr* = partial correlation coefficient.  
<sup>a</sup>*P* < .0001. <sup>b</sup>*P* < .001. <sup>c</sup>*P* < .05.

**Table 2. Motivators for quitting tobacco use, as ranked by tobacco-using participants at the 3 study intervention time points, %**

Motivators	Intake (n = 85)	Midpoint (n = 77)	Discharge (n = 71)
Health	88	90	89
Save money	34	40	46
Smells or tastes bad	25	30	36
Family	21	21	26
Stigma	13	n/a	n/a
Secondhand smoke	n/a	14	n/a
It's dirty	n/a	n/a	11

n/a = not applicable.

**Table 3. Obstacles to quitting tobacco use, as ranked by tobacco-using participants at the 3 study intervention time points, %**

Obstacles	Intake (n = 85)	Midpoint (n = 77)	Discharge (n = 71)
Being around others who smoke	47	47	56
Stress	41	41	40
Addiction	26	20	26
Craving	24	24	n/a
Daily habit	20	26	31
Boredom	n/a	n/a	26

n/a = not applicable.

When we controlled for nicotine dependence, readiness to quit and self-efficacy to quit were positively and significantly associated with change in smoking behavior, but, only at discharge, by which time, patients had already reduced their smoking by an average of 6 cigarettes per day. Moreover, patients' increased readiness to quit from intake to discharge also was positively and significantly associated with a reduction in cigarette consumption. These data suggest that patients' readiness and confidence to quit smoking may increase as they witness their usage decline over time.<sup>19,20</sup> While more precise research is needed to draw conclusions about the mechanisms of change at work when patients with SUDs reduce and eventually stop tobacco usage, this finding points to a promising direction for further inquiry. It suggests that efforts to promote even small changes in tobacco cessation may sow seeds for more significant changes in the future.

When considering tobacco cessation, the majority of tobacco users reported persistent concerns about

their health and, sadly, most of them had smoking-related illnesses. Participants in this study consistently reported 3 or more motivators to quit at each of the 3 intervention time points. Neither the number of motivators nor the number of obstacles, however, was associated with a change in smoking behavior—contrary to a previous study that found a positive association between having a greater number of perceived barriers to quitting smoking and a lower motivation to quit among patients in early treatment for alcohol dependence.<sup>17</sup> The findings of the current study are consistent with the findings of other studies showing that the frequency with which reasons to change behavior are articulated is not necessarily correlated with actual change.<sup>2</sup> Participants consistently reported that the 2 primary obstacles to smoking cessation were “being around others who smoke” and “stress.” Of note, patients did not report that their other SUDs were an obstacle to nicotine recovery, which refutes a common misconception in the recovery community that concurrent treat-

ment of nicotine and other SUDs is “too difficult” or “compromises sobriety.”<sup>22</sup> Stress has been identified as an obstacle to quitting smoking in other studies of smokers with SUDs,<sup>23,24</sup> and finding alternative means of coping is a common intervention in smoking cessation and general addiction recovery.<sup>16</sup> The impact of such patient-level interventions, however, is limited by the context in which they occur. For example, in most SUD treatment programs, the environmental context exposes patients to their greatest obstacle for smoking cessation: being around others who smoke.

As expected, few patients in this sample stopped using tobacco during the IOP, and only 2 achieved nicotine abstinence. Unexpectedly, 4 participants who recently had quit smoking began smoking again during the IOP, in which, almost 75% of patients were active tobacco users. The recent movement toward smoke-free grounds at substance abuse treatment facilities could be tremendously helpful in addressing this issue.<sup>25,26</sup> Expanding opportunities for patients to socialize and recover from their addictions in a smoke-free environment could increase the likelihood that a patient would quit smoking or remain nicotine abstinent while engaged in substance abuse treatment. Outcome data from smoke-free programs will be important to assess the impact of such environmental controls.

### LIMITATIONS AND FUTURE DIRECTIONS

The current study describes a sample of patients who reduced their tobacco usage and developed an increased motivation to quit using tobacco during the course of an SUD IOP. The study is limited by its retrospective design and by the correlational nature of some of its findings and, therefore,

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we can draw no strong conclusions regarding the causes of the changes we observed.

Although our sample of patients was primarily limited to male veterans (94%), our findings regarding the nature of motivators and obstacles were strikingly similar to qualitative studies of more heterogeneous groups of methadone maintenance patients and homeless individuals.<sup>27,28</sup> While replicating such previous findings, this study extends our knowledge of motivators and obstacles in nicotine recovery to a group of individuals receiving intensive outpatient treatment for SUDs. In addition, our naturalistic observations of a tobacco cessation intervention administered in a real-world SUD treatment setting may provide externally valid information that can guide future research efforts and help treatment providers gain a better understanding of the competing values with which patients struggle as they consider tobacco cessation while undergoing SUD treatment.

Although most patients were unable to achieve nicotine abstinence, our findings suggest that, overall, patients are able to make significant changes in their smoking behavior, that they have good reasons to change, and that their perceived obstacles are potentially surmountable. Future research should explore the mechanisms of change for smoking cessation in this population, taking into account patients' individual, social, and environmental needs. ●

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**Author disclosures**

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