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## Smoking Cessation and Chronic Pain: Patient and Pain Medicine Physician Attitudes

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### Abstract

Although previous studies suggest that the clinical setting of an interdisciplinary pain treatment program may provide an optimal environment to promote smoking cessation, currently available smoking cessation interventions may be less effective for adults with chronic pain due, in part, to unrecognized clinical factors related to chronic pain. The specific aim of this qualitative study was to solicit information from adult smokers with chronic pain participating in an interdisciplinary pain treatment program regarding their perceptions of how smoking affects pain symptoms, and how these beliefs, cognitions, and emotions may either impede or facilitate smoking cessation. Similar information was solicited from a group of pain specialty physicians. The study involved 18 smokers with chronic pain, and seven physicians. Patients reported that smoking was an important coping strategy for pain and distress, primarily by offering an opportunity for distraction and avoidance, respectively. The majority of patients using opioids reported that opioid consumption stimulated smoking. Important barriers were identified toward making a quit attempt during pain treatment including quitting smoking while making changes in opioid use, and perceived difficulty managing multiple treatment-related stressors. Several pain-related benefits of smoking cessation were identified by physicians, but important barriers to providing smoking cessation services were recognized including lack of time and knowledge about how to help patients quit smoking. The findings of this study identified several novel and important clinical factors that should be incorporated into a targeted smoking cessation intervention for adults with chronic pain.

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## Keywords

smoking; chronic pain; smoking cessation

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## INTRODUCTION

Among adults with chronic pain, smoking is associated with greater levels of pain, greater levels of depression and anxiety, worse physical functioning, and consumption of greater dosages of prescription opioids.<sup>1-5</sup> Although long-term treatment outcomes of therapies for chronic pain in ambulatory settings are worse in patients who smoke,<sup>6-9</sup> we have shown that the immediate outcomes of a 3-week interdisciplinary pain treatment program for patients with chronic pain were similar or significantly better in smokers compared to nonsmokers.<sup>1,4,5</sup> Because smoking may contribute to the pathophysiology of pain,<sup>10</sup> therapy for chronic pain may also provide an excellent opportunity for clinicians to address smoking behavior. However, it is not known how smoking cessation might affect pain symptoms. Although limited, current evidence suggests that it may be very difficult for patients with chronic pain to quit smoking.<sup>1,11</sup>

Our long-term goal is to design an efficacious intervention to help patients with chronic pain stop smoking, and to integrate the intervention into ongoing pain therapy. While this area of clinical research is highly novel to pain medicine, efficacious tobacco cessation interventions have been successfully integrated into the treatment protocols of several chronic illnesses.<sup>12,13</sup> As a first step toward designing an integrated smoking cessation intervention for adults with chronic pain, formative research is needed to identify the unique barriers and facilitators of smoking cessation in a clinical setting where patients are receiving treatment for chronic pain. The present study was conducted to determine the attitudes and beliefs of both patients and pain medicine physicians regarding smoking cessation interventions applied during pain therapy. Two qualitative studies were conducted as components of this formative research: (1) interviews with smokers participating in an interdisciplinary pain treatment program, and (2) interviews with pain medicine physicians.

## METHODS

### Study Participants

This study was approved by the Institutional Review Board, and written informed consent was obtained from all study participants. All patients were recruited from an outpatient interdisciplinary pain treatment program, and all physicians were pain specialty providers. Key informant interviews were conducted with five patients who smoked cigarettes and were undergoing treatment for chronic pain, five smokers who had previously undergone treatment for chronic pain within the past 6 months, and five who had previously undergone treatment for chronic pain and had concurrently received a brief smoking cessation intervention that was the standard of care at our institution.<sup>1</sup> A focus group was conducted involving an additional three smokers with chronic pain who were undergoing treatment. A separate focus group was conducted with seven pain specialty physicians including four anesthesiologists, two physiatrists, and one radiologist.

Patient inclusion criteria included status as a current cigarette smoker, age greater than 18 years, and persistent pain of greater than 6 months duration. Exclusion criteria included the co-occurrence of a substance abuse or dependence disorder, severe mood disorder, psychotic disorder or dementia. Patients were also excluded if they used other forms of tobacco including cigars, pipe, bidis, or smokeless tobacco. Attempts were made to recruit a similar number of men and women, and a similar number of opioid and nonopioid users. All patients were remunerated \$20 for study participation, but the physician participants waived remuneration.

### Study Setting

The study was conducted at an outpatient interdisciplinary pain treatment program; a treatment setting that has been previously described.<sup>14</sup> The outpatient program is of 3 weeks duration. Admissions to the program occur on a revolving basis, and patients attend 8-hours daily for 15 consecutive working days. A cognitive-behavioral model serves as the basis for treatment. The primary goal of treatment is functional restoration. During the course of treatment, patients are involved in daily physical reconditioning, biofeedback and relaxation training, stress management, chemical health education, activity moderation, and elimination of pain behaviors. Patients are also involved in daily cognitive-behavioral group educational sessions where the aforementioned aspects of pain rehabilitation are addressed.

### Patient and Physician Interviews

Participatory research has been defined as a systematic inquiry which involves the collaboration of those affected by the issue being studied for purposes of education, taking action, and effecting change.<sup>15</sup> This approach has been recognized as a strong method to improve the potential effectiveness and dissemination of behavioral change interventions. A semi-structured interview guide was developed by the investigative team for the patient and physician interviews (Table 1). All informant and focus group interviews were led by a single investigator. The informant interview was audiotaped and transcribed verbatim for subsequent analysis. The focus groups were videotaped to ensure that dialog was attributed to the correct participant in the group. All dialog from the focus groups were transcribed in a manner similar to the informant interviews.

### Measures

#### **Demographic, Clinical Characteristics and Determination of Opioid Dose—**

Demographic information and clinical characteristics were collected including age, pain duration, primary pain site, marital status, years of education, and medication use. The daily opioid dose of each patient was determined by self-report and review of pharmacy records, as previously described.<sup>16</sup> The daily opioid dose was converted to daily morphine equivalents using an equianalgesic conversion software program (Cynergy Group, Poulsbo, WA, USA).<sup>17</sup>

**Pain Severity—**Pain severity was assessed using the pain severity subscale of the Multidimensional Pain Inventory (MPI),<sup>18</sup> which has proven reliability and construct validity.<sup>19</sup> Raw scores from the pain severity subscale were converted to standardized *T*-

scores with a mean of 50 (range 0 to 100) and a standard deviation of 10.<sup>20</sup> Higher scores indicate greater pain severity.

**Center for Epidemiologic Studies-Depression Scale**—Depression was assessed using the Center for Epidemiologic Studies-Depression scale (CES-D), which has established reliability and validity in adults with chronic pain.<sup>21,22</sup> Scores range from 0 to 60 where higher scores indicate greater levels of depression.

**Pain Anxiety Symptoms Scale**—The short version of the Pain Anxiety Symptoms Scale (PASS-20) was used to measure pain-related anxiety and fear.<sup>23</sup> The 20-item self-report questionnaire has a score range of 0 to 100 where higher scores indicate greater levels of anxiety.

**Pain Catastrophizing Scale**—The Pain Catastrophizing scale (PCS) is a self-report questionnaire that assesses negative cognitions and emotions associated with actual or anticipated pain experiences.<sup>24</sup> The 13-item questionnaire has a scale range of 0 to 60, where higher scores indicate negative expectancies regarding the capacity to cope with pain.

**Short Form-36 Health Status Questionnaire (SF-36)**—The Short Form-36 Health Status Questionnaire (SF-36) was developed to assess health attributes during the past month.<sup>25–27</sup> Raw scores were converted to *T*-scores with a normative value of 50 and a standard deviation of 10. The standardized *T*-scores were calculated from published age- and gender-specific scores derived from the general U.S. population.<sup>28</sup> Higher scores on the physical and emotional functioning subscales reflect a more favorable health status.

**Fagerström Test for Nicotine Dependence**—The severity of nicotine dependence was assessed using the Fagerström Test for Nicotine Dependence.<sup>29</sup> The FTND is an abbreviated version of the Fagerström Tolerance Questionnaire.<sup>30</sup> The FTND has been found to predict smoking abstinence, and is correlated with biochemical measures of nicotine dependence.<sup>31</sup> Scores range from 0 to 10, with higher scores indicating greater levels of nicotine dependence.

## Data Analysis

Demographics (age, sex, ethnicity, marital status, educational status, employment status) and clinical characteristics (number of cigarettes smoked daily, pain duration, primary pain site, depression, pain severity, opioid use, daily morphine equivalent dose) of smokers were summarized. Mean and standard deviation (SD) were reported for continuous variables, and count and proportion were reported for categorical variables. All analyses were completed using SPSS (version 18.0; IBM Inc., Chicago, IL, U.S.A.).

Thematic and content analysis strategies were used to identify core concepts and to develop categories for coding interview and focus group data. Predominant themes, for example beliefs, cognitions, and emotions, were identified and a coding strategy was developed for each data source including patient interviews, and the physician and patient focus groups. All qualitative data were analyzed using methods of content analysis which is the systematic process of sorting and coding information based on themes.<sup>32,33</sup> Qualitative content

analytical approaches focus on analyzing both the explicit content of a text and the latent content which can be extrapolated from the text.<sup>34,35</sup> A qualitative software analysis program was used to facilitate data coding and sorting (QSR, Doncaster, Victoria, Australia; Non-numerical Unstructured Data Indexing Search and Theorizing; N6 2002).

## RESULTS

### Patient Characteristics

Table 2 contains baseline demographic and clinical characteristics of the patient participants. The pain severity subscale was near the 50th percentile of the MPI. However, the CES-D, PASS-20, and PSC were elevated, denoting high levels of depression, anxiety, and pain catastrophizing. The physical and social functioning subscales were 2 to 3 standard deviations below the 50th percentiles of the SF-36, indicating reduced levels of functioning.

### Patient Interviews

The patient focus group revealed themes that were highly consistent with the themes identified across individual interviews; thus, the responses from the focus group and the individual interviews were combined.

**Pain, Stress, and Smoking**—Patients described strong interactive connections between pain, distress, and cigarette smoking (Table 3). In particular, smoking was seen as an important coping strategy for pain and distress, primarily by offering an opportunity for distraction and avoidance. Patients explained that emotional distress can worsen pain (eg, “Stress makes your pain ten times worse”), and can increase urges to smoke (eg, “If I have an argument or final exam or something that’s a stressor, I have that feeling that I want to have a cigarette more”). Pain was also identified to lead to increase urges to smoke (eg, “My smoking is extremely related to my pain. When I have pain in my knee, instead of rubbing my knee I’ll go smoke a cigarette,” and “I know if I have a flare-up of pain or one of my shooting, stabbing pains ... yeah, I’ll want to go for a cigarette.”). Among those using opioids, most observed that use of these medications increased urges to smoke (eg, “When I was on a higher amount of opioids, it would make me a chain smoker,” and “Once the medication starts working, it’s like, okay I need to smoke a cigarette ... and then, you know, you could sit out there and smoke a few cigarettes before you feel satisfied. For every time the medication goes down, so does the number of cigarettes that I smoke in a day”). However, two patients indicated that use of opioids reduced urges to smoke (eg, “I probably smoke less with the medication, because it dulls the pain,” and “When I took more pain medication, it lessened my craving for cigarettes ... and when my mind’s cluttered with the opioids, it’s hard for me to concentrate on smoking. Like, oh yeah, I need a cigarette right now, and it had been like hours since I had my last one, and I just forgot all about smoking.”)

**Benefits of Attempting Smoking Cessation during the Interdisciplinary Pain Treatment Program**—The majority of patients interviewed (68%) described themselves as somewhat motivated to quit smoking, or viewed concurrent participation in the interdisciplinary pain treatment program as a potentially beneficial time to attempt quitting.

The predominant themes among the identified benefits of attempting smoking cessation while involved in the pain treatment program are presented in Table 4. A prominent theme was the importance of support for smoking cessation, and the availability of support within the pain treatment environment. Even among those patients reporting less motivation to quit, there was recognition that the peer and staff support within the pain treatment program would be important for quitting smoking. The structure and limited time available for smoking was also seen as an aid to smoking cessation while in the pain treatment program (Table 4). Additionally, the busy schedule and no-smoking environment provided distraction and reduced opportunities for smoking. Consequently, many cut back on smoking whether they were motivated to quit or not. A patient who had not been motivated to quit explained: “You’re locked in classes for 9 hours a day, so unless you sneak outside to have a cigarette, which they don’t give you much time to do that, it probably is a good time [to quit]. If I came in here and was off the medications completely, and I had this structured environment, then I believe it would help.”

Some patients recognized that the content of the interdisciplinary pain program also applied to smoking cessation including learning new coping strategies, changing behaviors, and changing pain-related cognitions (eg, “Some of the breathing techniques, managing stress, managing anxiety, the exercise ... quite a bit of it, you know, we have the relaxation tapes and CDs. They can all be applied too and be helpful to quit smoking,” and “We’re changing the whole way we think about life, so we might as well change the way we think about smoking at the same time”). Patients also described access to smoking cessation information and resources (medication and counseling) available while in the pain treatment program as beneficial (eg, “Here you have different ways to help you quit smoking or if you want to try any of the aids there are to help you quit smoking and having someone to talk to about it.”)

**Barriers to Attempting Smoking Cessation during the Interdisciplinary Pain Treatment Program**—Two subthemes regarding barriers to quitting smoking were described by patients (Table 5). The first subtheme among opioid users was the challenge of quitting smoking while making changes in opioid use. Secondly, patients described experiencing multiple concurrent changes and treatment-related stressors as barriers to smoking cessation. Though not a predominant subtheme, some patients expressed concern that quitting smoking would increase physical discomfort, both from pain and from nicotine withdrawal (eg, “I’d be afraid of the pain getting worse if I quit smoking. The pain would get worse and I know when I slowed down, you kind of go through the same withdrawals that comes as most of the medications”).

**Preferred Format and Content of a Smoking Cessation Intervention**—Patients preferred a group-based intervention for smoking cessation while in the interdisciplinary pain program. Consistent with the theme described above regarding benefits of attempting smoking cessation, patients viewed the support of others in a similar situation as important and helpful. For example, one patient said: “When you are one-on-one, you only have one person that’s giving you support, but in a group, they all help you and help themselves, so they’re all going through the same thing.” Other patients did comment on the helpfulness of individual sessions with a smoking cessation counselor, for a variety of reasons (no overall



theme), including greater likelihood to talk in a private session, individually targeted information, and individual support. In terms of program content, many viewed general medical information about smoking and smoking cessation as helpful (eg, “The carbon monoxide test opened my eyes. I didn’t realize you carried that amount around in your body for 24 hours after a cigarette”). Patients also recommended follow-up support once they had concluded the pain treatment program. Various types of follow-up support were suggested including social networks, telephone quitlines, email messages, and calls from the smoking cessation counselor.

**Use of Smoking Cessation Medications**—There was variability in knowledge, motivation and experience with use of stop smoking medications where some had used multiple medications and others had used none. Perceived barriers to use of medications included cost and acceptability (eg, “I’ve never used them, I’ve always refused them,” and “Medical coverage doesn’t cover them and they were too expensive for me” and “I’ve never tried the pills because the last thing I wanted was another pill in my system”).

**Importance of Individual Patient Preferences**—There was variability in readiness and preferred timing to set a target quit date. Patients emphasized individual differences and the importance of targeting smoking cessation treatment to the individual.

### **Pain Medicine Physicians’ Perspective**

Qualitative analysis of the focus group of physician specialists revealed three predominant themes (Table 6). All physicians perceived smokers as a more distressed and challenging subgroup of pain patients. Several physicians believed that many of these patients smoked to cope with stress and negative emotions. Some also believed that severe pain and opioid use were likely barriers to quitting smoking. Physicians also emphasized the barriers they had experienced in providing smoking cessation services to patients with chronic pain (Table 6). Barriers included lack of time, and lack of perceived confidence or skill to deliver a smoking cessation intervention. Some also described the challenges of providing a smoking cessation intervention within a pain-focused specialty evaluation. They expressed discouragement about patients’ perceived lack of motivation to quit smoking, and lack of professional interest in this aspect of patient care (eg, “I didn’t go into that, because it is not interesting to me”). Despite these barriers, the physicians named several benefits of patients quitting smoking including physical health benefits (eg, “It should help with their respiratory health”), improved coping (eg, “By quitting smoking you are learning different coping techniques that can also be used for their pain”), and enhanced patient confidence to make other positive life changes. When asked about their willingness to learn about a smoking cessation intervention for patients with chronic pain, the physicians were receptive, but most emphasized that the intervention would need to be very brief (ie, 5 to 10 minutes maximum).

## **DISCUSSION**

This qualitative study provides novel information about the attitudes and beliefs of smokers with chronic pain regarding the perceived interactions between smoking and pain, and smoking cessation interventions. We chose a qualitative research approach because these

methods have been recommended for collecting data sensitive to the unique personal experiences, perceptions, and behaviors of patients.<sup>36,37</sup> The value of qualitative data in health-related research is increasingly recognized in that knowledge of health and illness can be enhanced if it includes the subjective experience of the individual patient.<sup>37,38</sup> Furthermore, use of qualitative methods is the recommended first step in research designed to assess patient preferences and opinions,<sup>37</sup> including research related to tobacco cessation interventions.<sup>39</sup>

Patients identified that smoking was an important distractor from pain. This is a novel clinical observation that has not been previously recognized. Distraction is a widely used behavioral technique that focuses attention away from pain.<sup>40,41</sup> The use of distraction as a behavioral analgesic technique reduces clinical pain,<sup>42</sup> and distraction is associated with neurophysiologic changes in brain regions implicated in the endogenous modulation of pain.<sup>43,44</sup> Enhancing the motivation to participate in a distraction task further augments the analgesic effects of distraction, especially among individuals with high levels of pain catastrophizing.<sup>45</sup> This is particularly relevant because smokers with chronic pain have significantly greater levels of pain catastrophizing compared to both former and never smokers, and similarly elevated levels of catastrophizing were also observed among patients participating in the current study (Table 2). Collectively, these observations suggest that smoking may be a highly motivated task to distract attention away from pain, and the identification and incorporation of alternative distraction tasks could prove to be an important component of a targeted smoking cessation intervention for adults with chronic pain.

Smoking was also identified as an important strategy for managing various aspects of pain-related emotional distress. This was consistent with previous population-based studies<sup>46–49</sup> which was important because it supports, in part, the external validity of the observations from this small qualitative study. Smokers seeking treatment for chronic pain have been shown to have significantly higher levels of depression, pain-related anxiety, affective distress, and pain severity compared to nonsmokers with chronic pain.<sup>2,3,5</sup> These measures of emotional functioning are of clinical relevance in that greater levels of pain severity among smokers with chronic pain are due, in part, to greater levels of depression among smokers.<sup>50</sup> Additionally, higher levels of pain-related anxiety among adults with chronic pain have been associated with greater expectancies that smoking will reduce negative affect.<sup>51</sup> Despite greater levels of depression and negative affect, the immediate post-treatment outcomes of multidisciplinary pain treatment are not adversely affected by smoking status.<sup>1</sup> The absence of an effect of smoking status on immediate post-treatment outcomes is important because these data suggest that pain-related emotional distress among smokers improves during pain treatment, thus mitigating the potential adverse influence that these clinical factors could have on the effectiveness of an integrated smoking cessation intervention.

The majority of patients who used opioids reported that opioid consumption stimulated smoking, which could be explained, in part, by interactions between the nicotinic and opioid receptor pathways in the brain.<sup>10</sup> Nicotinic acetylcholine receptors (nAChRs) are widely distributed in the central nervous system, including regions associated with pain



transmission such as the thalamus, dorsal horn, and the locus ceruleus.<sup>52</sup> Presynaptic activation of nAChRs results in the release of numerous neurotransmitters including, but not limited to, dopamine, serotonin, norepinephrine, and glutamate.<sup>52,53</sup> In preclinical studies, the antinociceptive effects of nicotine and morphine are interrelated,<sup>54,55</sup> and cross-tolerance between nicotine and morphine has been demonstrated in mice.<sup>56</sup> In humans, use of higher dosages of methadone have been associated with increased cigarette smoking,<sup>57–59</sup> whereas the opioid antagonist naltrexone attenuates smoking behavior.<sup>60,61</sup> Among adults with chronic pain, we have previously observed that smokers were more likely to use opioids compared to nonsmokers, and the morphine equivalent dose of smokers was significantly greater compared to nonsmokers.<sup>4,5</sup> As previously suggested,<sup>10</sup> the observed interactions between the nAChR and opioid receptor systems may be mediated, in part, by the mesolimbic dopaminergic pathways in that activation of nAChR and opioid receptors potentiates the release of dopamine in the nucleus accumbens.<sup>55,62</sup> This latter phenomenon is particularly relevant in that the nucleus accumbens has been shown to mediate the reward effects of nicotine and to modulate pain perception.<sup>63,64</sup> However, it is not known whether opioid use represents a primary barrier to successful smoking cessation in patients with chronic pain. The interaction between nicotine and opioid consumption identified in this study was consistent with the observations from previous preclinical and clinical studies, and suggests that the status of opioid use is an important clinical factor to consider in the design of a targeted smoking cessation intervention for adults with chronic pain.

Two major challenges identified by patients toward making a quit attempt during the pain treatment program were: (1) quitting smoking while making changes in opioid use, and (2) perceived difficulty of managing multiple treatment-related stressors. Despite these two potential barriers, the majority of patients expressed a willingness to consider quitting smoking during the pain treatment program, which was consistent with our previous observations.<sup>1</sup> More specifically, with regards to patient concerns about quitting smoking while making changes in opioid use, a previous study from our pain treatment program found that smokers who completed treatment were equally likely to be successfully tapered from opioids compared to nonsmokers.<sup>5</sup> The willingness of patients to consider smoking cessation, combined with the demonstrated success of opioid tapering among smokers, suggests that an integrated smoking cessation intervention should target patient concerns about making concurrent changes in opioid use in an attempt to overcome this potential barrier. Smokers in this study also expressed concern about managing multiple stressors related to concurrent participation in the pain treatment program. There has been increased interest in the integration of smoking cessation services into the established treatment protocols of several chronic illnesses,<sup>65–67</sup> and previous clinical trials demonstrate the effectiveness of these integrated models of care.<sup>12,13,68</sup> Although smokers in our study perceived that it would be difficult to make multiple changes and to manage multiple treatment-related stressors, these previous studies suggest that these particular barriers would be modifiable, and that strategies aimed toward mitigating treatment-related stress should be incorporated into an integrated smoking cessation intervention.<sup>69,70</sup> Consistent with the results of past research that involved patients receiving care for chronic illnesses, it would be anticipated that an integrated tobacco cessation intervention would have favorable effects on the long-term abstinence rates of smokers receiving care for chronic pain.

The attitudes of physicians who treat chronic pain are also important in considering methods to intervene in smokers with pain. Pain physicians had a generally unfavorable perception of smokers with chronic pain; smokers were perceived to have greater levels of pain and emotional distress, and to be overly reliant on passive treatments for pain. The physicians also believed that lack of time and skill were important barriers to providing clinical services for smoking cessation. These barriers were similar to the barriers identified in other groups of physician specialists including lack of time to deliver an intervention and insufficient knowledge about treatment options.<sup>39,71</sup> However, the deployment of targeted smoking cessation interventions in specialty care environments has been favorably received by physicians.<sup>72,73</sup> The physician focus group also identified that patient's negative affect and high levels of stress were additional barriers to providing smoking cessation services.

This study has several limitations. All patients were specifically referred to a tertiary medical center, and had the resources to participate in a 3-week outpatient program. Additionally, the study participants selfselected to participate in the group-based program for chronic pain that also incorporated opioid tapering. Consequently, the findings of the study may not reflect the attitudes and beliefs of the general population of smokers with chronic pain. However, the clinical characteristics of patients admitted to our pain treatment program are similar to those of a random sample of community adults with chronic pain derived from the catchment area of our medical center.<sup>74</sup> The study findings could have also been influenced by social desirability in that study participants may have been inclined to respond to inquires about tobacco use in socially desirable terms.

In conclusion, this qualitative study identified several novel patient factors that could impact smoking cessation outcomes among adults with chronic pain including use of smoking as a distraction task and the potential interaction between smoking and opioid use. Treatment-related stress was identified as an important barrier, but previous studies have demonstrated that smoking cessation interventions can be successfully integrated into the established treatment protocols of other chronic illnesses. Based on the observations from this study, some unique and important elements of an integrated tobacco intervention targeted to smokers with chronic pain should include providing alternative methods of pain distraction, stress mitigation during pain treatment, and careful management of prescription opioids.

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**Table 1**

## Key Questions from the Semi-structured Interviews

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 Patient Interview

- How interested would you be in quitting smoking while participating in the pain treatment program (ie, why this may or may not be a good time to quit)
- If you do not try to quit during treatment program, would you be interested in trying to quit at another time (ie, why quitting at another time is preferred)
- What benefits do you think you would get from quitting smoking during the pain treatment program (ie, pain-related benefits, general health or societal benefits)
- What problems do you think may occur if you quit smoking during the pain treatment program (ie, pain- and nonpain consequences)
- If you decide to quit, what do you think would be helpful (ie, specific clinical setting or approach, use of medication)

## Physician Interview

- Do you think it is important for smokers with chronic pain to quit (ie, clinical priority of smoking cessation)
  - Do you think there are clinical links between smoking and chronic pain (ie, effects of smoking on clinical course of chronic pain)
  - Do you think smoking cessation would impact chronic pain (ie, would smoking cessation impact the course of chronic pain)
  - What role do you think pain medicine physicians should have in smoking cessation (ie, willingness to provide smoking cessation services)
  - Do you have the knowledge and skill to promote smoking cessation (ie, familiarity with smoking cessation interventions)
  - Are there barriers to providing smoking cessation services in your practice (ie, administrative or organizational obstacles)
  - Are there patient barriers to providing smoking cessation services in your practice (ie, clinical factors that could impede smoking cessation)
-

**Table 2**

## Baseline Patient Characteristics

<b>Demographic and Clinical</b>	<b>Patients (N = 18)</b>
Male gender, N (%)	10 (56)
Age (mean $\pm$ SD)	39.0 $\pm$ 10.3
Ethnicity	
Caucasian	16 (89)
African American	2 (11)
Married	9 (50)
Years of education	13.3 $\pm$ 2.1
Currently employed	7 (39)
Pain duration, years	9.6 $\pm$ 10.5
Primary pain site	
Low back pain	6 (33)
Headache	4 (22)
Fibromyalgia	3 (17)
Neck pain	2 (11)
Generalized pain	1 (6)
Lower extremity pain	1 (6)
Facial pain	1 (6)
Smoking	
Cigarettes per day	18.3 $\pm$ 7.1
Years of smoking	19.4 $\pm$ 9.7
Number previous quit attempts	4.2 $\pm$ 1.1
Fagerström Test for Nicotine Dependence	4.5 $\pm$ 2.2
Pain	
Opioid use	11 (61)
Morphine equivalent dose (mg/day)	227 $\pm$ 356
MPI pain severity	51.2 $\pm$ 8.6
Centers for Epidemiologic	30.4 $\pm$ 13.3
Studies-Depression scale	
Pain Catastrophizing Scale	30.5 $\pm$ 10.2
Pain Anxiety Symptoms Scale	51.9 $\pm$ 17.9
SF-36 physical functioning	18.5 $\pm$ 18.3
SF-36 social functioning	30.7 $\pm$ 11.6

MPI, Multidimensional Pain Inventory pain severity subscale.

**Table 3**

## Patient Theme and Subthemes Related to Smoking as a Coping Strategy

<u>Opioid Status</u>	<u>Gender</u>	<u>Representative Quotes</u>
<i>Theme: Smoking is a coping strategy for pain and emotional distress</i>		
Subtheme: Smoking is a distraction from physical pain		
U	F	I'm thinking of the cigarette and what I have to do to lift the cigarette, puffing it, and lighting it, and holding it; so it diverts me away from the pain
NU	F	When you're dealing with chronic pain, it's always where your focus is. You have a headache you can go out and have a cigarette. ... it isn't going to make it better but it changes the focus on what you originally were focused on. Smoking is a great distraction tool ... it's a way to escape, gather your thoughts, and then come back in and take another crack at it
U	M	When I'm smoking, I'm not thinking about the pain. It kind of eases off a little bit. I mean, I don't know how to explain, but I try not to think about it when I'm smoking
U	M	When I hurt, I smoke. I'll go out on the back steps, and I'll light one right after the other when I hurt ... it takes your mind off it
U	M	If I'm a passenger in a car, the pain is twice as bad. If I'm driving, I'm a lot better. It's a distraction. When you smoke a cigarette, it takes your mind off the withdrawal symptoms and the pain. When you're smoking, you don't even think about the pain. It's a good way to kind of forget about the pain temporarily. While you're smoking your cigarette, the pain is still there but your concentration is on what you're doing rather than on what you're feeling
Subtheme: Smoking is a coping strategy for emotional distress		
NU	F	Things are hard and like at a fast pace. I go out and have a cigarette, and I'll take a different point of view and look at it kind of from the outside in
NU	F	It puts me in a better mood. When some thing upsets me at work or if I want to avoid a certain person or something like that, I go have a cigarette
U	F	The cigarettes are the brick wall that I put up. It's something that I can say—well, I can't go into the restaurant so I don't have to deal with you, you know, because I've got to smoke, and it works well over at my Mom and Dad's because I can't smoke at their house, so I've got to go outside, so it's like—It's avoidance. Probably avoidance of my feelings

U, using opioids; NU, using opioids.

**Table 4**

## Patient Theme and Subthemes Related to the Benefits of Quitting Smoking

<u>Opioid Status</u>	<u>Gender</u>	<u>Representative Quotes</u>
<i>Theme: There are benefits to quitting smoking during the pain treatment program</i>		
Subtheme: Support from other patients (smokers and nonsmokers)		
NU	F	There are several other people who are trying to quit smoking at the same time so it's good to talk to them about how they are doing and what ways they are trying to quit smoking
U	F	Definitely more support here than at home ... and it was just helpful to have other people that are going through the same situation you are. There are other people that are trying to quit with you
U	F	I think it helps having the peers that aren't doing it (smoking) ... I mean, going through the same thing we're going through, you know. And you can say—hey, you know what, even though you want to go have a cigarette, why don't you come with me and we'll do something else, or you know, the staff
NU	F	The benefit is the support, because it's not just with smokers, it's with nonsmokers. The nonsmokers are the ones you really need to hang around with, no matter what. Support is already here not just for smoking but the support is here for every kind of little thing we're going through
NU	F	You can't do it alone. You need help; you need people to support you. It's very important because when you have smoking as a pain trigger, you need somebody that understands that you have pain as well, and that you are using your cigarettes to counteract that pain, so they need to understand where you're coming from with your pain as well as your need to stop smoking
NU	F	That same feeling that you're not out there, you're not alone, that there are people that are going to be going through nicotine withdrawals and the physical withdrawals the same as you are
Subtheme: Schedule and structure of the pain program limit opportunities to smoke		
U	F	You're busy with positive things like the physical therapy and occupational therapy
U	M	Well, we have the structure; first, I can't ... I don't have the ability. We have the law out in front
U	F	I think the structure here is that you're on a timeline and you've got to stay and you only get so much time; it's harder to run out the door
NU	F	The habit and the routine. The routine here is different from that at home
U	M	Your mind is not on it. You've don't have the time. You may think: Gosh, I want a cigarette. You've got 35 minutes left of class and it runs over and you have to rush to the next class, you don't have the option to sneak out and smoke a cigarette

U, using opioids; NU, not using opioids.

**Table 5****Predominant Theme and Subthemes Related to the Barriers of Attempting Smoking Cessation During the Pain Rehabilitation Program**

Opioid Status	Gender	Representative Quotes
Subtheme: Changes in opioid dose is a barrier to smoking cessation		
U	F	It's stressful because you are trying to get off your pain medication, so you're trying to learn different ways to deal with your pain while at the same time you're trying to get the pain medication out of your body
U	F	I do think along with the pressure of quitting the opiates ... I have seen myself increase in smoking a little bit ... I mean the smoking's bad but I think right now, actually, I think I need to quit the opiate use first
U	F	I would prefer not to do it [attempt smoking cessation] while I'm tapering ... just kind of like—one at a time. Interviewer: What is your first priority? Patient: Darvocet. Interviewer: What's the second priority? Patient: Lyrica. Interviewer: Third priority? Patient: Smoking
U	M	I have enough on my plate right now. Getting off opioids. I'm going through withdrawal from that, and now I'm also taking on withdrawal from cigarettes
U	F	There are so many other changes going on. Giving up cigarettes, that is my best friend, you know, and having to give that up on top of giving up the little pill that made me feel better for that half hour
Subtheme: Difficulty managing multiple changes and stressors		
NU	F	Because you are making such big changes in your life that you would think you wouldn't want to add quitting smoking at the same time because it is so difficult ... very, very stressful
U	M	I'm getting off all medication and I just don't want to set myself up for failure by giving up too many things at once ... I'm actually surprised that any one that comes to this program works on quitting smoking because of the added stress ... If you try to give up too many things at once you're just kicking your own butt. It's just too much
NU	M	I had too many other things to challenge myself during that time period (when in PRC). My son needed to pass a math class in order to graduate high school, and I was helping him. I was going to a lot of AA meetings where people do smoke
U	M	I think I have enough on my plate with everything else going, and I'm going to leave smoking

U, using opioids; NU, not using opioids.

Table 6

## Predominant Themes and Subthemes from Physician Focus Group

<u>Specialty</u>	<u>Gender</u>	<u>Representative Quotes</u>
<i>Theme 1: Smokers represent a more challenging subgroup of patients with chronic pain</i>		
Anesth	M	When I walk into a room and I smell heavy cigarette smoke, I immediately form a mental image of someone that is going to have a significant degree of anxiety, maybe depression, and again, that they use chemicals to cope
Physiatrist	M	My gut response would be that they definitely seem to be more apt to have a higher pain reading
Anesth	M	For people who have chosen to smoke, they have already made sort of a poor decision and so, you kind of wonder if you can really count on them to make good decisions in the future regarding their care. Especially if opioids are involved
Anesth	M	When I walk into a room and smell just an ashtray, even before they speak or I examine them, it makes me feel like this patient is going to have a very passive approach to their pain
<i>Theme 2: There are physician barriers to providing smoking cessation services</i>		
Subtheme: Lack of time		
Physiatrist	M	It's hard in the current health care market just because we don't have enough time to spend with the patient, as much as you would like
Anesth	M	I think that smoking cessation should be a high priority but quite honestly, with the time constraints, I don't address it with 100% compliance
Anesth	M	Chronic pain patients have multiple medical problems ... and trying to just zone in on the smoking part, is difficult. I just don't think we have the time to do that
Subtheme: Lack of confidence or clinical skill		
Anesth	M	I have failed miserably. I can't get anyone to stop smoking. I don't know if I've not gotten the right tools to use ...
Anesth	M	Take [varenicline] for instance, I know that there is an association with severe depression and how to solve it. Those things make me uncomfortable, and to the fact that I don't prescribe any because I believe it is really outside of my area
<i>Theme 3: Patient stress is a barrier to delivering smoking cessation services</i>		
Anesth	M	With chronic pain patients, they are stressed at what is going on in their life and they see smoking as an outlet that may help relieve some of that stress
Physiatrist	M	When they are in pain, they are like; <i>Well, I can't give up smoking right now.</i> We see them when they feel they are under the most stress, in regards to their pain. And they see their smoking as a stress releaser
Anesth	F	We hear that ... the patient is under too much stress right now to take on quitting smoking. It's just not the right time

Anesth, anesthesiologist.