

# Treatment of Tobacco Dependence in Mental Health and Addictive Disorders

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People with mental health and addictive (MHA) disorders smoke at high rates and require tobacco treatment as a part of their comprehensive psychiatric care. Psychiatric care providers often do not address tobacco use among people with mental illness, possibly owing to the belief that their patients will not be able to quit successfully or that even short-term abstinence will adversely influence psychiatric status. Progress in the development of treatments has been slow in part because smokers with current MHA disorders have been excluded from most smoking cessation trials. There are several smoking cessation treatment options, including psychological and pharmacological interventions, that should be offered to people with an MHA disorder who smoke. Building motivation and readiness to quit smoking is a major challenge, and therefore motivational interventions are essential. We review the treatment options for people with tobacco dependence and MHA disorders, offer recommendations on tobacco assessment and tailored treatment strategies, and provide suggestions for future research. Treatment efficacy could be enhanced through promoting smoking reduction as an initial treatment goal, extending duration of treatment, and delivering it within an integrated care model that also aims to reduce the availability of tobacco in MHA treatment settings and in the community.

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### Highlights

- Tobacco treatment combining cognitive-behavioural therapies and motivational enhancement interventions tailored to the needs of smokers with MHA disorders, as well as pharmacotherapy integrated into ongoing psychiatric care, provides the best abstinence outcomes.
- Tobacco treatments do not appear to have an adverse effect on psychiatric symptoms. On the contrary, patients may demonstrate significantly improved clinical status following treatment regardless of abstinence status.
- Smoking reduction (reduction as the initial treatment goal), a chronic disease approach, and integrated care strategies have the potential to improve the efficacy of existing smoking treatment tailored to MHA smokers.

**Key Words:** tobacco dependence, mental health, addiction, smoking cessation, smoking reduction, pharmacotherapy, cognitive-behavioural treatment, tobacco ban

Substantial progress has been achieved during the last decade in the treatment of tobacco use and dependence among people with MHA disorders. However, despite the steady increase in the efficacy of treatments for nonpsychiatric smokers, as well as tailored interventions for people with comorbid TD and MHA disorders, longer-term quit rates (more than 6 months) remain disappointingly low for MHA smokers, and significantly lower than the quit rates observed among nonpsychiatric smokers.<sup>1</sup>

We review our current understanding about treatment of tobacco use and TD in people with MHA disorders, and identify promising treatment strategies that could be integrated into current treatments to improve cessation outcomes in these populations. One factor associated with the slow progress in the treatment of TD is that smokers with current MHA disorders are often excluded from smoking cessation trials, especially those evaluating novel pharmacotherapies.<sup>2,3</sup> Encouraging retention and abstinence results from the initial treatment studies,<sup>4-7</sup> as well as the discussions of subsequent review papers,<sup>1,8-12</sup> have helped to focus attention on this important comorbidity in MHA populations.

Following brief overviews of smoking-related assessment in psychiatric smokers and standard cessation treatments, we evaluate the efficacy and safety of smoking treatments tailored to smokers with current MHA disorders, including mood and anxiety disorders, schizophrenia and (or) schizoaffective disorders, and SUDs. Several recent treatment studies have involved samples of smokers with a broad range of primary DSM diagnoses. Outcomes of interest for the

studies reviewed in our paper include treatment adherence and (or) retention, short- (less than 3 months) and long-term (more than 6 months) abstinence or reduction, and changes in psychiatric symptoms. (Tables organized by MHA population describing study samples, smoking cessation treatment[s] evaluated, primary abstinence outcomes measures, and results are available on request.)

### Assessment of TD in People With Mental Illness

While tobacco use appears to be routinely documented by treatment providers,<sup>13</sup> much greater emphasis needs to be placed on diagnosing TD,<sup>14</sup> especially given the evidence that people with MHA disorders who smoke may experience more severe psychiatric symptomatology.<sup>15</sup> The approach to assessing tobacco use and TD in people with MHA disorders is similar to that recommended for nonpsychiatric smokers (see Fiore et al<sup>16</sup> for the USPHS Clinical Practice Guidelines for treating tobacco use and TD, and see Niaura and Shadel<sup>17</sup> for an extended guide to smoking-related assessment).<sup>9,11</sup>

Assessment should include evaluation of smoking rate (for example, number of cigarettes smoked daily), smoking history (for example, age of initiation and age of daily smoking), perceived psychological, physical, and social benefits associated with smoking, and readiness to quit smoking.<sup>18,19</sup> Also important to assess is history of serious quit attempts (lasting greater than 12 hours) and associated craving and withdrawal symptoms, treatment history including longest periods of abstinence, changes in psychiatric symptomatology or drug and alcohol craving or use during past quit attempts, and perceived barriers to abstinence.<sup>9</sup>

Many of the commonly used smoking-related self-report measures have been found to have good validity and reliability in smokers with MHA disorders. These include the FTND,<sup>20</sup> which measures level of nicotine dependence. The reliability of the FTND has been established in smokers with PTSD<sup>21</sup> and in schizophrenia and schizoaffective disorder.<sup>22</sup> A high degree of nicotine dependence, as measured using the FTND, is indicated by the following smoking behaviours: smoking first cigarette of the day soon after awakening, smoking more frequently during first hours of waking, finding the first cigarette of the day most satisfying, difficulty refraining from smoking in places where smoking is not permitted, heavy daily smoking, and smoking despite physical illness. These smoking behaviours are often observed in MHA smokers. Other smoking-related measures, including the Minnesota Nicotine Withdrawal Scale<sup>23</sup> and the Questionnaire of Smoking Urges,<sup>24</sup> have also been found to have comparable validity and reliability in smokers with MHA disorders.<sup>22</sup>

#### Abbreviations used in this article

BD	bipolar disorder
CBT	cognitive-behavioural therapy
CM	contingency management
DSM	Diagnostic and Statistical Manual of Mental Disorders
FTND	Fagerstrom Test for Nicotine Dependence
MDD	major depressive disorder
MET	motivational enhancement therapy
MHA	mental health and addictive
NRT	nicotine replacement therapy
PTSD	posttraumatic stress disorder
RCT	randomized controlled trial
SUD	substance use disorder
TD	tobacco dependence
TNP	transdermal nicotine patch
USPHS	United States Public Health Service

## Standard Treatment Options for TD

The USPHS Clinical Practice Guidelines<sup>16</sup> for the treatment of smoking and TD recommends that physicians, as well as a range of other medical professionals, offer psychological counselling and pharmacotherapy to all smokers wanting to quit. Counselling approaches include self-help programs (printed or electronic materials that are designed to increase motivation and enhance readiness to quit smoking, manage withdrawal symptomatology, and prevent slips and relapses back to smoking), telephone counselling, more intensive CBT approaches, such as individual and group counselling, and health care provider interventions.<sup>16,25</sup>

CBT integrates cognitive therapies (for example, learning cognitive coping skills to manage negative mood or urges to smoke associated with acute or prolonged nicotine withdrawal), behavioural therapies (for example, changing habits to anticipate and avoid temptations to smoke, and securing extratreatment social support), and motivational therapies (for example, counsellor support and reinforcement of patient-generated reasons for quitting and sustaining abstinence). CBT may be effectively delivered by either a smoking cessation counsellor or a health care provider, involves individual and (or) group counselling, and range in intensity from brief (10- to 15-minute sessions) to intensive (50- to 60-minute sessions). There is a strong positive correlation between total amount of cessation counselling and abstinence.<sup>16</sup> Combining CBT with medication is necessary to optimize outcomes. Modifications of CBT for smoking cessation in people with schizophrenia<sup>6,26-28</sup> and depression<sup>29,30</sup> have been developed to deal with the unique needs of MHA smokers.

Recommended first-line smoking cessation therapies include NRTs (nicotine patch, gum, spray, inhaler, and lozenge) and sustained-release bupropion (Zyban), both of which increase odds of quitting about 2-fold, compared with placebo.<sup>31,32</sup> Self-administered NRT, such as nicotine gum or inhaler, may deliver systemic nicotine more quickly than the other forms of NRT to target acute cigarette cravings.<sup>24,33</sup>

Varenicline (Champix, an alpha-4 beta-2 nicotinic acetylcholine receptor partial agonist) was added in the USPHS Clinical Practice Guidelines 2008 update as a recommended first-line medication, and has been found to increase the odds of long-term abstinence about 3-fold, compared with placebo, and 1.5-fold, compared with sustained-release bupropion. For smokers who do not respond to first-line medications, nortriptyline and clonidine are second-line medications that have been shown to offer similar efficacy, compared with NRT and bupropion.<sup>32,34</sup> However, owing to their side effect profiles,<sup>35,36</sup> caution is recommended with their use.

In response to postmarketing reports of severe adverse events (for example, treatment-emergent psychosis, mania, impulsivity, agitation, and suicidality) associated with use of varenicline, the US Food and Drug Administration<sup>37</sup> and Health Canada have advised physicians to monitor their patients taking varenicline for neuropsychiatric symptoms. However, no treatment-related neuropsychiatric symptoms were observed in the varenicline studies of nonpsychiatric smokers<sup>38-41</sup> or 2 preliminary studies involving smokers with MHA disorders.<sup>42,43</sup> Current studies in the United States, Canada, and Europe are examining the safety and efficacy of varenicline in MHA smokers.

## Tailoring Existing Treatments to Smokers With MHA Disorders

Treating TD in patients with MHA is challenging. Because the mechanisms that sustain smoking may differ among the various MHA disorders (see Morisano et al<sup>44</sup>), smoking cessation treatments have tended to focus on single disorders. Treatment adherence and retention are critical obstacles to overcome in MHA smokers. This section provides an overview of smoking treatment options organized by MHA diagnosis. Consistent with current USPHS Clinical Practice Guidelines,<sup>16</sup> all of the studies that we review combined psychological and pharmacological cessation interventions. Unless otherwise noted, the abstinence rates reported throughout this paper are biochemically confirmed 7-day point prevalence abstinence (defined as the prevalence of abstinence during the 7 days immediately preceding follow-up) and based on intent-to-treat samples.

### *Schizophrenia and Schizoaffective Disorders*

Rates of smoking and TD are higher among people with schizophrenia and related psychoses, compared with other psychiatric disorders.<sup>1,9</sup> This recognition has led to significant research efforts to find effective smoking cessation treatments for this MHA subgroup. The most widely studied treatments include tailored CBT in combination with NRT,<sup>4,6,26,45-47</sup> bupropion,<sup>27,28,48-52</sup> or varenicline.<sup>42</sup> Bupropion is currently the best pharmacotherapy option, consistently demonstrating significantly higher quit rates than placebo.<sup>27,46,49,52</sup>

Two studies of treatment combining bupropion, NRT, and group CBT are especially noteworthy. Both studies involved outpatients with schizophrenia who reported high motivation to quit smoking prior to the interventions. George et al<sup>52</sup> evaluated 10 weeks of sustained-release bupropion (300 mg daily), compared with placebo combined with tailored CBT and 21 mg TNP, in smokers with DSM-IV schizophrenia or schizoaffective disorder ( $n = 58$ ). End-of-treatment and 6-month follow-up abstinence rates were significantly higher for the bupropion-treated group than for the group that

received placebo medication (at 10 weeks, 34.5%, compared with 10.3%, and at 6 months, 13.8%, compared with 0%). Comparably high quit rates were achieved in a similar study conducted by Evins et al<sup>28</sup> that also included nicotine gum for the management of acute urges to smoke. This study of outpatients with DSM-IV schizophrenia ( $n = 51$ ) tested 12 weeks of sustained-release bupropion (300 mg daily), compared with placebo combined with group CBT and dual NRT (21 mg TNP and 2 mg nicotine gum as needed up to 18 mg daily). As compared with placebo, bupropion significantly increased abstinence at end-of-treatment (36%, compared with 19%) and at 3-month follow-up (12%, compared with 8%).

### **Mood Disorders**

A substantial percentage of smokers with current depression are motivated to quit smoking (about 25%), and with formal assistance, accept smoking cessation treatment.<sup>53–55</sup> The treatment literature has focused on unipolar depression and most recently BD. The attention to BD is crucial given its 60% smoking prevalence (United States).<sup>9</sup>

*Unipolar Depression.* The highest long-term abstinence rate among smokers with MDD was achieved in a study conducted by Hall et al,<sup>56</sup> which used a stepped-care approach and relaxed treatment inclusion criteria to include smokers who reported little or no interest in stopping smoking. The study compared a stepped-care intervention delivered during 12 months, compared with brief contact control treatment in smokers with DSM-IV MDD ( $n = 322$ ). The stepped-care intervention included 2 treatment components: a computerized expert system based on the stage of change model<sup>57</sup> and the option (which was strongly recommended by the intervention counsellors) of receiving six 30-minute psychotherapy sessions that included mood management training, TNP, and (or) bupropion. Abstinence rates at 12 and 18 months were significantly higher for the stepped-care group (20% and 25%, respectively) than for the brief contact control group (13% and 19%, respectively).

A study by Chengappa et al<sup>5</sup> evaluated the efficacy of open-label sustained-release bupropion (300 mg daily) for 9 weeks in smokers with remitted DSM-IV MDD ( $n = 26$ ) who had been maintained for at least 8 weeks on selective serotonin reuptake inhibitor antidepressants. Prior to starting medication, patients received one session of behavioural counselling based on the United States National Cancer Institute's "How to Help Your Patients Stop Smoking." Results for treatment retention and end-of-treatment abstinence were encouraging: 19/25 (76%) completed treatment and 8/25 (32%) achieved abstinence.

*Bipolar Disorder.* Weinberger et al<sup>58</sup> conducted a preliminary RCT comparing sustained-release bupropion (300 mg daily) with placebo for 10 weeks in combination with weekly group

behavioural counselling in smokers with DSM-IV BD I. Results of this study are encouraging in that one of the patients treated with bupropion ( $n = 2$ ) was abstinent at 10 weeks, whereas none of the placebo-treated patients ( $n = 3$ ) achieved abstinence. Moreover, bupropion was well tolerated in this study.

The efficacy of bupropion as a treatment for smokers with either BD I or II is promising but requires further investigation in RCTs with larger samples. As indicated by Hall et al's study,<sup>56</sup> extending the course of psychological and pharmacological treatment may be highly beneficial because it allows repeated quit attempts that are often necessary before sustained abstinence can be achieved.

### **Anxiety Disorders**

Tobacco treatment among smokers with anxiety disorders has been limited to PTSD. The first RCT compared sustained-release bupropion (300 mg daily), compared with placebo, for 12 weeks in a small sample ( $n = 15$ ) of combat veterans with a primary diagnosis of DSM-IV PTSD.<sup>7</sup> Sixty-seven percent of patients also met criteria for MDD and 47% had another anxiety disorder (mostly social phobia). Both groups received 6 sessions of individual behavioural counselling based on the United States National Cancer Institute's "How to Help Your Patients Stop Smoking." Among the bupropion-treated patients, 70% completed treatment. At the end of the treatment, 60% of patients were abstinent as defined by exhaled carbon monoxide levels of 10 parts per million. Forty percent maintained this abstinence 6 months later.

As discussed in greater detail later, the integrated care model, which is the integration of substance use treatment and treatment of mental disorders delivered by a single provider, has shown promise among smokers with PTSD in 2 RCTs and has been widely advocated.<sup>59–61</sup> Patients with other anxiety diagnoses, such as panic disorder, also smoke at higher rates and appear to have greater difficulty quitting smoking than people without MHA disorders.<sup>62,63</sup> Whether treatment combining psychological counselling and bupropion and (or) NRT has similar efficacy among smokers with other anxiety disorders (but not PTSD) needs to be evaluated.

### **Mixed MHA Samples**

Four recent studies<sup>43,64–66</sup> have evaluated many of the same psychological and pharmacological treatments described in the previous sections among samples of smokers with various primary MHA diagnoses, often including psychotic, mood (BD I and II), anxiety, and other SUD.

Treatments that yielded higher abstinence rates than control interventions included NRT<sup>43,64</sup> and varenicline.<sup>43</sup> Baker et al<sup>64</sup> evaluated 10 weeks of individual counselling (CBT,

motivational interviewing) and 21 mg TNP, compared with self-help treatment, in smokers with nonacute psychotic disorder ( $n = 298$ ) (International Statistical Classification of Diseases and Related Health Problems, 10th Revision). Self-help treatment consisted of print materials and access to general practitioners and publicly funded community mental health providers. Abstinence rates at 3 and 6 months were 15% and 9.5% for the counselling plus TNP group, compared with 6% and 4% for the self-help intervention group.

The efficacy of varenicline for smoking cessation in smokers with various psychiatric diagnoses was evaluated by Stapleton et al.<sup>43</sup> This open-label, nonrandomized treatment study of smokers with MHA disorders ( $n = 111$ ) and smokers without MHA disorders ( $n = 301$ ) compared the first varenicline-treated participants in a United Kingdom National Health Service tobacco clinic with NRT participants who had completed treatment immediately prior to the introduction of varenicline. Primary diagnoses among the MHA group were depression ( $n = 64$ ), BD ( $n = 14$ ), psychosis ( $n = 7$ ), psychosis and depression ( $n = 24$ ), and eating disorder ( $n = 2$ ). Both groups received 7 group supportive counselling sessions during 6 weeks. The evaluation period for both groups was 6 weeks. Abstinence was defined as no smoking (even a puff) during the final 2 weeks of treatment and confirmed by exhaled carbon monoxide levels of less than 10 parts per million. Among the group of MHA smokers, 71.7% of participants treated with varenicline were abstinent at 6 weeks, as compared with 55.2% of the NRT participants. Especially encouraging was the observation that these short-term abstinence rates were comparable to those observed in the non-MHA group (varenicline 72.3%, NRT 63.7%).

### **Addictive Disorders**

The prevalence of smoking is especially high among people with SUDs,<sup>9</sup> in part because most of this population also has one or more of the MHA disorders discussed previously. Smoking cessation treatments that have been found to have modest short-term efficacy in this population include various combinations of CBT, TNP, CM, and MET.<sup>67-73</sup> In contrast, an RCT of sustained-release bupropion (300 mg daily) for 9 weeks among smokers in treatment (outpatient or inpatient) for alcohol dependence ( $n = 58$ ) did not increase the rate of self-reported abstinence at end of treatment (17% for bupropion, 25% for placebo).<sup>67</sup> One-third (10/30) of the bupropion-treated group discontinued medication within the first 4 weeks of treatment, compared with only 11% (3/28) of the placebo-treated group. Grant et al<sup>67</sup> speculated that this high rate of discontinuation of bupropion (substantially higher than observed in studies of nonpsychiatric smokers, at 6% to 12%) may have been due to side effects, particularly insomnia. During weeks 1 to 4 of treatment, 11 of 30 participants reported significant insomnia.

A major issue in this population has been the appropriate sequencing of smoking treatment and treatment for SUD.<sup>9,19,69</sup> Specifically, should smoking cessation treatment be provided concurrently with SUD treatment, or delayed until after successful remission of the SUD? Evidence indicates that concurrent treatment of TD in the context of SUD treatment can be efficacious and does not have a significant adverse influence on SUD treatment outcomes.<sup>69,72,73</sup>

### **Smoking Reduction as an Intermediate Treatment Goal**

Smoking cessation treatments in which treatment participation and smoking reduction have been targeted outcomes, with abstinence as the implicit end point, have tended to be more successful in achieving substantial smoking reduction and eventual abstinence in MHA smokers.<sup>56,65</sup> Treatment focuses initially on building motivation and readiness to quit smoking, developing the cognitive and behavioural skills needed to manage nicotine withdrawal, urges to smoke, and triggers for relapse, and to secure necessary extratreatment social support.

Gallagher et al<sup>65</sup> applied this approach in their study of smokers ( $n = 180$ ) with various DSM-IV-defined MHA disorders. Prior to treatment, 48% reported being motivated to quit smoking, whereas 50% reported being motivated only to reduce smoking (not to quit completely). Primary diagnoses were psychotic spectrum ( $n = 85$ ) and mood and (or) anxiety disorder ( $n = 95$ ). Forty-six percent of patients reported co-occurring substance use. This RCT compared the effect of CM, CM plus 21 mg TNP, and self-help print materials. Participants in the 2 CM groups earned progressively more money for biochemically confirmed abstinence at each weekly visit across 24 weeks. The maximum possible earnings was US\$480 plus \$100 for participation and completion of measures. Abstinence was defined using salivary cotinine (levels less than 15 mg/mL) and exhaled carbon monoxide (levels less than 10 parts per million). Carbon monoxide-defined abstinence rates at 36 weeks were 43% (26/60) for CM plus TNP, 37% (22/60) for CM only, and 8% (5/60) for the self-help condition. Cotinine-defined abstinence was substantially lower for the 2 CM conditions: 2% for CM plus TNP, and 7% for CM only, suggesting that participants had stopped smoking just prior to each visit. Gallagher et al<sup>65</sup> suggested that the efficacy of their CM intervention could potentially be improved by increasing frequency of monetary reinforcement. Alternatively, it has been argued that reinforcing abstinence that is defined using salivary and (or) urinary cotinine, which is sensitive to smoking up to 48 hours, could have a greater effect on smoking cessation.<sup>74</sup>

Among non-MHA populations, smoking reduction among people not currently interested in quitting has been

demonstrated to significantly increase the probability of future abstinence.<sup>75</sup> There are also potential positive health consequences, as the risks of smoking-related disease are highly correlated with the amount of cigarettes smoked daily.<sup>76</sup>

### Does Smoking Treatment Adversely Affect Psychiatric Status?

A major barrier to smoking treatment in MHA populations has been the perception that attempting to quit smoking and (or) successful smoking cessation will undermine mental health treatment efforts and eliminate a primary source of pleasure for patients with MHA disorders. Conversely, neither smoking reduction nor abstinence appears to adversely affect psychiatric functioning. Smoking cessation has actually been found to improve depression and anxiety symptoms,<sup>5,58,61,77</sup> and positive and negative symptoms.<sup>27,28,49</sup> Other studies have found no change in clinical status across smoking cessation treatment.<sup>6,42,46,52,64,66</sup>

Although abstinence does not adversely affect clinical status, it may worsen certain cognitive deficits associated with schizophrenia. Smoking decreases or normalizes attentional and haloperidol-induced working memory deficits,<sup>78-80</sup> and abstinence has been found in one study to exacerbate working memory deficits following smoking cessation treatment, an effect that was not observed in nonpsychiatric control smokers.<sup>49</sup>

Cigarette smoking increases the metabolism of some antipsychotic medications, as well as potentially other psychotropic medications, by inducing the P<sub>450</sub> 1A2 isoenzyme. This effect is secondary to the polycyclic aromatic hydrocarbons that are components of tobacco smoke; nicotine does not influence cytochrome P<sub>450</sub> 1A2 activity.<sup>81</sup> Commonly used agents with a metabolism affected by tobacco smoking include olanzapine, clozapine, haloperidol, amitriptyline, and caffeine.<sup>81,82</sup> The reduced medication blood levels caused by increases in the smoking rate may explain why smokers with schizophrenia may experience reduced antipsychotic side effects, compared with nonsmokers, and why doses in smokers are traditionally higher (for example, extrapyramidal symptoms).<sup>83</sup> Therefore, clinicians should monitor for increased medication side effects during smoking cessation.

### Tobacco Policy for Inpatient Psychiatric Units

Smokers with MHA disorders often do not have access to supports that help to promote quitting and sustained smoking abstinence. The psychiatric treatment setting, especially inpatient units, can serve an important role in promoting smoking cessation.<sup>11</sup> Concern that restricting smoking may exacerbate clinical status has contributed to a reluctance to enforce

smoking bans and (or) encourage smoking cessation among such patients,<sup>11,84,85</sup> despite evidence that smokers, compared with nonsmokers, present with more severe symptomatology.<sup>15</sup> Most studies report positive outcomes following inpatient bans.<sup>86</sup>

Formal institutional and systems barriers, including restricted formularies and insurance reimbursement for smoking treatments, exceptions to smoking bans in MHA facilities, and inadequate staff training in cessation counseling, further contribute to this problem.<sup>87</sup> There is a lack of training in tobacco treatment among mental health professionals, and perhaps owing to stigma, lack of information, or perceived hopelessness for abstinence, there has been a lack of focus on MHA smokers from primary care providers and smoking cessation specialists.<sup>87,88</sup>

### Integrated Treatments for Tobacco Use in Psychiatric Populations

Increasing the efficacy of treatment among smokers with MHA disorders can be achieved by delivering treatment in the context of routine psychiatric care. McFall et al<sup>61</sup> compared the effectiveness of smoking treatment delivered by mental health providers who were also responsible for the smokers' PTSD treatment (integrated care; *n* = 33), compared with treatment delivered through a smoking cessation clinic (usual care; *n* = 33). Both groups were encouraged to make multiple quit attempts during the 9-month study. Continuous abstinence, defined as 7-day point prevalence abstinence at 4, 6, and 9 months, for integrated care was 12%, compared with 3% for usual care. Comparably high continuous abstinence rates (18% and 12%) for the integrated care intervention were reported by McFall et al<sup>59</sup> in a 2-site study involving a larger sample (*n* = 107).

Mental health care providers may be ideal providers of tobacco treatment because: there is an ongoing therapeutic alliance; patients return for treatment of their psychiatric symptoms even if they are not seeking support for smoking cessation, and repeated quit attempts can be encouraged by the provider; and, it is cost-efficient as tobacco treatment is delivered within planned mental health care visits.<sup>1</sup>

As a large-scale follow-up to their initial studies, McFall et al<sup>60</sup> are conducting a randomized effectiveness trial of integrated treatment, compared with usual care, among smokers with DSM-IV PTSD (expected *n* = 1400). Participants are being recruited from 10 US Department of Veterans Affairs medical centres across the United States. Follow-up assessments are scheduled to be conducted every 3 to 6 months for up to 4 years. Outcomes to be assessed include prolonged smoking abstinence, depression- and PTSD-related outcomes, and cost-effectiveness. Whether similar integrated

smoking treatment is as effective for smokers with other MHA disorders should be a priority for future research.

## Potential Keys to Improving Smoking Cessation Treatment Outcomes

### *Behavioural Interventions Targeting Treatment-Seeking Smokers With MHA Disorders*

Given that low readiness to quit has been a major obstacle to improved cessation outcomes, a major component of smoking cessation treatment in smokers with MHA disorders has been MET, according to Miller and Rollnick.<sup>89</sup> MET has been a treatment component in studies of smokers with schizophrenia,<sup>6,26,49,52</sup> MDD,<sup>56</sup> and mixed disorders.<sup>64</sup>

In addition to potentially contributing to improved smoking cessation outcomes (the incremental improvement in outcome associated with MET has not been studied), MET has been found to influence smoking treatment seeking. A single session of MET with personalized feedback (for example, expired carbon monoxide level, and discussion of social, financial, and medical costs associated with cigarette smoking) was effective in motivating 32% of smokers with schizophrenia to seek smoking treatment within 1 month of the single session intervention, compared with 11% receiving an educational intervention and 0% provided with information only.<sup>90</sup>

CM is another intervention that may facilitate readiness to quit smoking, as well as smoking reduction or abstinence, when the person is actively engaged in smoking cessation treatment. Positive effects on smoking reduction have been found in laboratory-based studies<sup>91,92</sup> and in the study by Gallagher et al.<sup>65</sup> Whether CM can increase the efficacy of treatment involving bupropion is being evaluated.<sup>74</sup> One concern with CM is that once contingencies are withdrawn, smoking relapse is likely. CM combined with relapse-prevention approaches (for example, CBT and medications) may assist in achieving high rates of initial abstinence that can then be prolonged with maintenance treatment. Further development and (or) refinement of MET for increasing treatment seeking and CM for smoking cessation should be the focus of future research.

### **TD as a Chronic Illness**

TD is a chronic illness,<sup>16,32,93,94</sup> and therefore requires repeated intervention and multiple quit attempts. For most people, especially those with MHA disorders, smoking begins in adolescence and persists across adulthood, with numerous cycles of brief remission and relapse. Acute care has been the model in the treatment of TD. Psychological and pharmacological treatments are typically provided for 12 weeks (for example, bupropion) or less in the case of NRT if the patient relapses. Successful cessation requires ongoing intervention.

Among smokers without MHA, extending the duration of treatment improves abstinence rates. This has been found in treatment combining nortriptyline and group behavioural counselling for 12 months.<sup>93</sup>

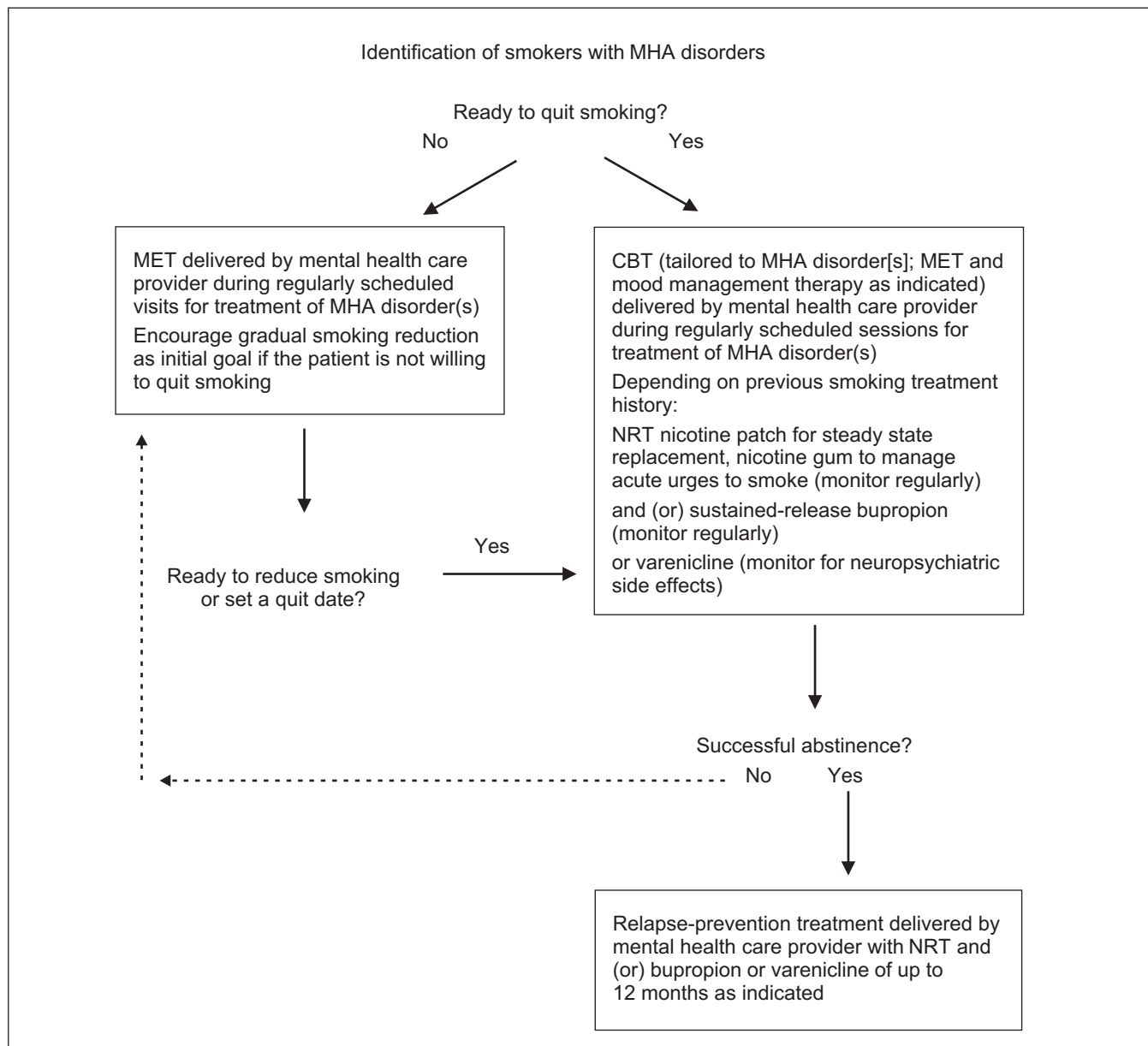
Smokers with current MHA may be especially likely to benefit from extended or maintenance treatment. Only one study has evaluated the efficacy of extended pharmacotherapy in smokers with MHA disorders. In this relapse prevention trial of smokers with schizophrenia or schizoaffective disorder, Horst et al<sup>47</sup> randomized abstainers (17/50) after 3 months of treatment that combined TNP, weekly group sessions of behavioural counselling, and patient-initiated telephone support to either continued TNP or placebo for another 6 months. Both maintenance phase groups participated in group counselling sessions at least twice monthly. Abstinence was defined by exhaled carbon monoxide levels of 10 parts per million. Despite the small sample, results were promising: 6 of the 9 active TNP patients maintained abstinence at 6 months, as compared with none of the 8 placebo-treated patients.

## Conclusions and Recommendations

Our review highlights the advances during the last decade in the treatment of TD in people with MHA disorders. Much progress has been achieved. Treatment combining intensive CBT and multiple pharmacotherapy has shown the greatest efficacy. Among the many studies measuring changes in psychiatric symptoms during smoking treatment, most show improvements. Increasing the efficacy of these interventions may be achieved through extending the duration of treatment, providing them in the context of mental health care,<sup>60</sup> and promoting reduction as an acceptable initial treatment goal. MET and CM as adjunctive interventions to increase readiness to quit, treatment usage, and smoking abstinence (or reduction) should also be evaluated in future studies, and CBT should be used as a part of relapse-prevention therapy. Experimental therapies, such as selegiline and nicotine vaccine, among others, have yet to be tested in MHA smokers.<sup>95</sup> An evidence-based algorithm for the general approach to smoking cessation in people with MHA disorders is displayed in Figure 1.

Additional recommendations include creating and establishing programs to raise the awareness and ability of mental health care professionals to identify and treat people with TD.<sup>9</sup> In addition, there is a strong need for:

1. Studies of larger samples through multisite collaborations for increased generalizability.
2. Detailed descriptions of intervention protocols to facilitate replication and dissemination.
3. Better monitoring and reporting of treatment delivery and usage.

**Figure 1** General approach to treating TD in MHA disorders

4. Multiple measures of outcome, including compliance and retention, biochemically verified smoking reduction and abstinence, changes in psychiatric symptoms, and cost-effectiveness.

With the exception of obsessive-compulsive disorder, all of the major MHA disorders are associated with a significantly higher prevalence of smoking than that found among the general US population.<sup>9</sup> To date, there has been only one treatment study of smokers with BD, and none have targeted smokers with panic disorder. The evidence suggests that many of the patients with these disorders may be able to reduce their smoking or achieve abstinence if provided with

treatment. Future research is needed for these MHA subgroups.

Lastly, there is a critical need for research aimed at identifying smoker characteristics that predict positive smoking cessation treatment outcomes (usage, reduction, and [or] abstinence) among smokers with MHA. For example, some studies have found that atypical antipsychotic medication is associated with short-term abstinence in treatment combining MET and NRT or bupropion.<sup>6,49</sup> To the extent that people with schizophrenia smoke to help alleviate pathophysiologic aspects of their condition, such as prefrontal cortical and information processing deficits, pharmacological treatments

targeting these processes may lead to improved cessation outcomes.<sup>9,31</sup> A similar approach is needed in treatment studies of smokers with other MHA diagnoses.

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**Résumé : Le traitement de la dépendance au tabac dans les troubles de toxicomanie et de santé mentale**

Les personnes souffrant de troubles de toxicomanie et de santé mentale (TSM) fument à des taux élevés et ont besoin d'un traitement du tabagisme dans le cadre de leurs soins psychiatriques complets. Les prestataires de soins psychiatriques ne s'attaquent pas souvent au tabagisme chez les personnes souffrant de maladie mentale, possiblement en raison de la croyance que leurs patients ne seront pas capables de réussir à cesser de fumer ou que même une abstinence de courte durée aura des effets indésirables sur l'état psychiatrique. L'élaboration de traitements progresse lentement en partie parce que les fumeurs souffrant de troubles de TSM actuels ont été exclus de la plupart des essais sur l'abandon du tabac. Il existe plusieurs options de traitement pour l'abandon du tabac, dont des interventions psychologiques et pharmacologiques, qui devraient être offertes aux personnes souffrant d'un trouble de TSM qui fument. Susciter la motivation et la détermination de cesser de fumer est un défi majeur, et donc, les interventions motivationnelles sont essentielles. Nous examinons les options de traitement pour les personnes dépendantes au tabac qui souffrent de troubles de TSM, offrons des recommandations sur l'évaluation du tabagisme et les stratégies de traitement personnalisées, et donnons des suggestions pour la future recherche. L'efficacité des traitements pourrait être améliorée en prônant la réduction du tabagisme comme objectif de traitement initial, la prolongation de la durée du traitement, et l'administration du traitement dans un modèle de soins intégrés qui vise aussi à réduire la disponibilité du tabac dans les établissements de traitement des troubles de TSM et dans la collectivité.