



# TOBACCO FREE FUTURES

guidelines

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## CHAPTER 19

# Specific Populations: Addiction and Mental Health

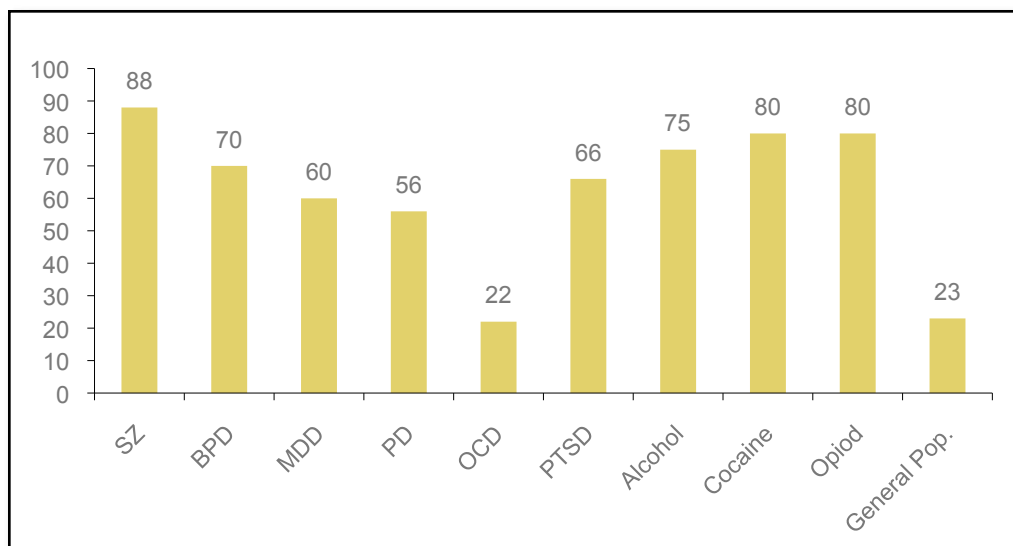


# INTRODUCTION

## Prevalence of tobacco use in addictions and mental health

Although smoking prevalence in the general population has decreased, there are many individuals who have not been able to quit. Two important groups are those with psychiatric disorders and those with substance use disorders. According to data from the United States, rates of smoking are 2 to 4 times higher among people with psychiatric disorders and substance use disorders.<sup>1</sup> In fact, tobacco users with psychiatric disorders consume nearly half of all the cigarettes consumed in the United States.<sup>2,3</sup>

**Figure 19.1: Prevalence of Current Smokers With Psychiatric and Substance Use Disorders**



Note: SZ = schizophrenia, BPD = bipolar disorder, MDD = major depressive disorder, PD = panic disorder, OCD = obsessive-compulsive disorder, PTSD = post-traumatic stress disorder

Multiple explanations have been offered for the high rate of smoking among people with addictions and mental illness, including genetic factors, the physical effects of nicotine, self-medication, limited education, poverty, unemployment, peers and the mental health treatment system, wherein tobacco use is generally tolerated and not seen as a health issue.<sup>1,2</sup> A recent study found evidence in internal tobacco industry documents that the tobacco industry monitored or directly funded research supporting the idea that individuals with schizophrenia were less susceptible to the harms of tobacco and needed tobacco as self-medication.<sup>4</sup> These documents also revealed that the industry has promoted smoking in psychiatric settings by providing cigarettes and supporting efforts to block hospital smoking bans.<sup>4</sup>

## Impact of tobacco use and exposure

Like other smokers, those who are mentally ill have a high risk of smoking-related death. Individuals with serious mental illness die, on average, 25 years prematurely, with the leading causes being chronic tobacco-related diseases.<sup>5</sup> Among clients in treatment for substance use disorders who smoke, 51% died of tobacco-related causes—a rate double that of the general population.<sup>6</sup> Persons with psychiatric or substance-use disorders are at higher risk than individuals in the general population for many tobacco-related diseases, including

- larynx cancer
- esophageal cancer
- trachea, bronchus and lung cancer
- pancreatic cancer
- stroke
- cardiovascular disease
- diabetes
- pneumonia
- chronic obstructive pulmonary disease, asthma and other respiratory illnesses<sup>1,3,6</sup>

The relative risks of developing cancers of the mouth and throat are 7 times greater for tobacco users, 6 times greater for those who use alcohol and 38 times greater for those who use both alcohol and tobacco.<sup>10</sup>

With a risk of death from these tobacco-related diseases that is 2 to 4 times greater than the general population, treating tobacco dependence is central to addressing the disproportionate morbidity and mortality rates among people with serious mental illness.<sup>5,6,7</sup>

## Tobacco treatment in addictions and mental health settings

Health benefits aside, people with addiction and mental health concerns have other reasons to quit tobacco, including improved overall quality of life, greater satisfaction with leisure activities, greater satisfaction with social relationships, more money and better access to housing.<sup>7,8</sup> These outcomes are significant not only to the individual but also to the health care system in Alberta, which uses outcome measurements such as the Health of the Nation Outcome Scales (HONOS) to inform decision-making and program planning across addiction and mental health care.<sup>9</sup>

### INTEGRATION OF TOBACCO-FREE TREATMENT

Tobacco use has long been an accepted part of the culture of care in addictions and mental health treatment. In treatment, smoking is often associated with social activities or with breaks. People may smoke to feel part of a group and may be afraid that quitting tobacco will damage their social relationships in treatment.<sup>10</sup> In substance abuse treatment settings, smoke breaks can reinforce the social connection to tobacco. This is unfortunate because these settings provide an ideal opportunity for initiating tobacco treatment services, motivating clients to quit and supporting clients in staying tobacco-free.<sup>7</sup> Table 19.1 outlines some of the findings of facilities that have no tobacco-use ban or partial tobacco-use bans compared to those that have become completely tobacco-free (no tobacco use indoors or outdoors).

**Table 19.1: Impact of Incomplete or Complete Bans of Tobacco Use in Treatment Facilities**


	<b>PARTIAL OR NO BAN</b>	<b>COMPLETE BAN</b>
<b>CONFLICT AND AGGRESSION</b>	There is significant evidence that the bartering and control of tobacco products between staff and patients can be a source of conflict. <sup>11</sup>	Psychiatric care settings that have implemented tobacco and smoke-free policies that completely eliminate tobacco use report fewer behavioural problems, decreased coercion, decreased violence, no increase in discharges against medical advice and reduced seclusion or restraints. <sup>11,2,12</sup> Hospitals that do not permit smoking experienced significantly fewer aggression issues related to tobacco use compared to hospitals that do. <sup>13</sup>
<b>STAFF TIME</b>	The amount of time spent on facilitating tobacco use is estimated at up to four hours per day, including getting cigarettes, giving cigarettes, lighting cigarettes, managing patient disputes over cigarettes, cleaning up cigarettes and observing patient smoking on or off the unit. <sup>7</sup>	Implementing policies of complete tobacco use bans have been shown to reduce the amount of time staff spend managing the smoking culture. <sup>11</sup> Staff also report an increase in job satisfaction. <sup>13</sup>
<b>PATIENT CESSATION</b>	Studies have shown increases in tobacco use during admittance to addiction and mental health facilities where tobacco use is permitted. <sup>14</sup>	When complete smoking bans are in place, there are no cues for patients to smoke. Coupled with access to cessation supports such as pharmacotherapy, many patients are surprised by how well they can manage without tobacco. <sup>7</sup>

Despite these benefits, restrictive policies alone seem to have little or no effect on tobacco cessation.<sup>15</sup> Offering cessation treatment, especially for relief of withdrawal symptoms, is an important part of support for clients during periods of abstinence.<sup>2</sup> In fact, it has been reported that failure to address nicotine withdrawal is associated with a rate of discharges against medical advice that is twice as high for smokers who are offered support for withdrawal than that of non-smokers.<sup>16</sup>

### **HEALTH PROVIDERS IN ADDICTIONS AND MENTAL HEALTH**

There is strong evidence that tobacco use is closely linked to severe mental illness and has a major detrimental impact on individuals' lives. Yet the historic smoking culture still prevails within the majority of addictions and mental health settings. For instance, cigarettes continue to be used as a means of reward and punishment for inpatients.<sup>17</sup> Cessation programs for clients accessing mental health services have cited the negative attitudes of staff and their refusal to engage with cessation programs as their greatest challenge.<sup>17</sup>

Addictions and mental health professionals are ideally positioned to treat tobacco dependence. They are able to combine psychopharmacological and behavioural/counselling treatment, often are trained in substance abuse treatment and are able to identify and address any changes in psychiatric symptoms during the withdrawal period. Unfortunately,



many of these professionals maintain the view that smoking is an effective coping mechanism for their clients and a means of self-medicating in order to cope with symptoms.<sup>17</sup> There is reluctance among these professionals to acknowledge the importance and feasibility of addressing smoking, which may be rooted in the misconception that people with severe mental illness generally do not want to quit smoking or that clients will become violent. The evidence does not support these assumptions.<sup>11,17</sup>

It is clear that much work needs to be done to raise awareness amongst health care professionals working in addictions and mental health about the importance of quitting. These professionals are well suited to support their clients in their tobacco cessation. Especially for people with cognitive impairment, a consistent approach, where all health care professionals encourage tobacco cessation, is needed.<sup>18</sup> It is recommended that addressing tobacco be integrated into the routine care provided at addictions and mental health treatment settings, including mandatory training at all staff levels.<sup>19</sup> Change is urgently required to prevent a widening of existing health disparities.

## TOBACCO TREATMENT RECOMMENDATIONS

Those dealing with mental health issues benefit from the same type of cessation support as the general public. All smokers with psychiatric disorders, including substance use disorders, should be offered tobacco dependence treatment.<sup>20,21</sup> It is important for health care providers to be aware of the impact of smoking cessation on comorbid conditions and recognize that these patients/clients are at higher risk of relapse.<sup>21</sup>

### CAN-ADAPTT smoking cessation guidelines

The Canadian Action Network for the Advancement, Dissemination and Adoption of Practice-informed Tobacco Treatment (CAN-ADAPTT) is a practice-based research network facilitating research and knowledge exchange among practitioners, researchers and policy makers in the area of smoking cessation. CAN-ADAPTT's guideline for smoking cessation is intended to guide practice and is not intended to serve as a comprehensive overview of smoking cessation management.<sup>21</sup>

The CAN-ADAPTT Guideline Development Group has provided the following Grade 1A summary statements (strong recommendations with high-quality evidence) for addictions and mental health:

- “Summary Statement #1 – Health care providers should screen persons with mental illness and/or addictions for tobacco use.”
- “Summary Statement #2 – Health care providers should offer counselling and pharmacotherapy treatment to persons who smoke and have a mental illness and/or addiction to other substances.”
- “Summary Statement #3 – While reducing smoking or abstaining (quitting), health care providers should monitor the patients'/clients' psychiatric condition(s) (mental health status and/or other addiction(s)). Medication dosage should be monitored and adjusted as necessary.”

**For more information, visit the CAN-ADAPTT website:**

[www.can-adaptt.net](http://www.can-adaptt.net)

## Nicotine dependency and withdrawal

The psychological and physiological similarities between tobacco dependence, psychiatric disorders and substance use disorders could account for the high rates of tobacco use in the population that has addictions and mental health disorders. Most smokers with mental health concerns smoke significantly more, have increased levels of nicotine dependency and are therefore at even greater risk of smoking-related harm. Heavy smokers tend to have more symptoms during nicotine withdrawal, including mood difficulties.<sup>2</sup> Common psychiatric and addiction withdrawal symptoms are very similar to nicotine withdrawal symptoms, including

- cannabis: irritability, difficulty sleeping, strange nightmares, craving and anxiety
- cocaine: depression, fatigue, increased appetite, insomnia or hypersomnia, vivid and unpleasant dreams, psychomotor retardation and agitation
- prescription stimulants abuse: depression, fatigue, increased appetite, insomnia or hypersomnia, vivid and unpleasant dreams, psychomotor retardation and agitation
- methamphetamine: depression, anxiety, fatigue and intense craving for the drug
- inhalants: mild withdrawal syndromes (e.g., irritability, restlessness, insomnia, headaches, poor concentration) can occur with long-term abuse
- opioids: restlessness, muscle and bone pain, insomnia, diarrhea, vomiting, cold flashes with goose bumps (when quitting “cold turkey”) and leg movements
- psychiatric disorders (e.g., major depression, anxiety disorders): sleep disturbance (increased or decreased), decreased energy, difficulty concentrating, changes in appetite (increase or decrease), anxiety, depressed mood, anger, irritability and frustration<sup>22,23</sup>

Many of the neurotransmitter systems that are affected by nicotine administration through tobacco use are involved in the pathogenesis of psychiatric and substance use disorders, including

- dopamine: schizophrenia, bipolar disorders and alcohol and drug addiction
- norepinephrine: bipolar disorders, major depressive disorders and cocaine dependence
- serotonin: major depression and PTSD
- acetylcholine: schizophrenia and major depression
- endogenous opioid peptides: opioid and alcohol dependence
- glutamate: schizophrenia, bipolar disorders and major depression
- gamma-aminobutyric acid (GABA): schizophrenia, major depressive disorders and cocaine dependence
- endocannabinoids: cannabis and opioid dependence<sup>24</sup>

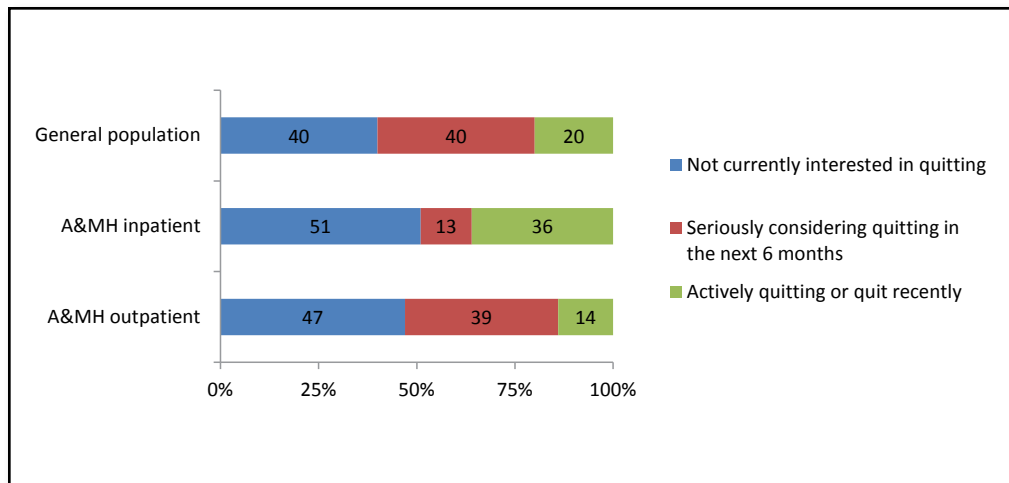
Some researchers suggest that tobacco may also be used by patients to self-medicate for transient relief of psychiatric symptoms.<sup>24</sup>



## Readiness to quit

People with psychiatric and substance use disorders have the same levels of motivation and desire to quit as does the general population. In 2009, Calgary's Foothills Medical Clinic found that 51% of addiction and mental health patients were pre-contemplative (no timeline or not interested in quitting), 12.7% contemplative (desired to quit in the next 6 months), and 36.2% preparatory (desired to quit in the next 30 days) or action-oriented (actively cutting down or quit recently).<sup>25</sup> The motivation in outpatient addiction and mental health patients is 47.4% pre-contemplative, 38.6% contemplative and 14.0% preparatory or action-oriented.<sup>8</sup> In the general North American population, those rates are 40% pre-contemplative, 40% contemplative and 20% preparatory or action-oriented.<sup>26</sup>

Figure 19.2: Readiness to Quit



The majority of current smokers in the Foothills Medical Clinic research (79.3%, n = 92) expressed concern about their smoking, with 40.5% (n = 47) somewhat concerned, 20.7% (n = 24) considerably concerned and 18.1% (n = 21) seriously concerned.<sup>25</sup> Ratings of concern about smoking and the perceived difficulty of quitting did not vary significantly across the diagnostic groups.<sup>25</sup> Those with higher nicotine dependence did not have statistically greater concerns about their smoking than others.<sup>25</sup>

## Brief tobacco intervention

Tobacco use negatively affects mental health treatment.<sup>24</sup> Increasing evidence indicates that individuals with psychiatric disorders can be aided in quitting smoking without threat to their mental health recovery. Integration of tobacco cessation treatment within psychiatric settings is encouraged so that clinicians can identify and address nicotine withdrawal and any changes in psychiatric symptoms during the quit attempt.<sup>7</sup> Addiction and mental health clients can quit smoking without adverse effect to their mental health recovery.

# ALZHEIMER'S DISEASE AND DEMENTIA

Smoking cessation could prevent or slow the progression of dementia and should become an integral part of the prevention and treatment of dementia.<sup>27</sup> Smoking cessation in older adults should receive the same attention as other modifiable risk factors, such as hypertension and diabetes.<sup>28</sup> In Alberta, persons aged 45 and up have a lower rate of cigarette smoking compared with other age groups, at 17.2%.<sup>29</sup> Traditionally, it was thought that older adults were not interested in quitting and there was no clinical reason for an older tobacco user to quit.<sup>30</sup> In fact, older adults are just as willing as younger adults to try to stop using tobacco.<sup>28</sup> There is now a substantial body of evidence of meaningful benefits of tobacco cessation, even after many years of tobacco use.<sup>31</sup> Older persons who quit can

- significantly reduce their risk of other chronic illnesses, such as lung cancer, stroke, coronary artery disease, peripheral vascular disease and chronic obstructive pulmonary disease
- enhance their quality and length of life
- improve their mobility and prevent the loss of mobility
- improve their physical strength<sup>33,34,35,36</sup>

Given the health benefits of quitting tobacco at any age, the potential difficulty of placement into longer term care or daily assisted living settings and the risk of fire and injury with declining cognitive ability, tobacco treatment should be a part of the standard of care for all persons, especially for older adults with dementia.

## Treatment considerations

### COGNITIVE DEFICITS AND COMORBID CONDITIONS

The proper treatment of cognitive deficits related to dementia and other comorbid conditions is a critical first step in the overall care of the person.<sup>36</sup> Comorbid conditions are common in elderly patients with cognitive impairment and could impact tobacco treatment attempts if not addressed.<sup>36</sup> Disorders to be considered include sensory deficits (especially deficits in vision or hearing), dental problems, depression and other medical conditions that commonly affect the elderly.<sup>36</sup> Properly managing comorbid conditions could improve tobacco cessation treatment outcomes.

There is growing evidence in clinical practice that clients engaging in tobacco treatment should be screened for mild to moderate degrees of cognitive impairment.<sup>30</sup> Executive cognitive functions are essential to behavioural self-regulation and are essential for sustaining behaviour change over time, including the behaviour change required for tobacco cessation.<sup>37</sup> Although Brega et al. (2008) found that impaired executive cognitive functioning has only a modest impact on the success of tobacco cessation efforts in older populations, interventions targeting behaviour change in older adults should consider the special needs of those with executive impairment.<sup>37,30</sup> Understanding the status of a patient's executive function will allow health care professionals to arrange the resources and enlist the multidisciplinary support to enhance a patient's tobacco treatment outcomes.



## FAMILY EDUCATION AND SUPPORT

The most important factor for successful smoking cessation for persons with dementia is to engage and educate the person's family, particularly the primary agent or decision maker.<sup>38,36</sup> An alliance between the family and the health care team is the principal means of ensuring the treatment plan is followed. The physical and emotional health of the family, especially the primary caregiver, is critical to the care of the patient with dementia.<sup>39</sup> Family members who are in a caregiving role have a higher rate of depression and physical illness.<sup>39</sup> A close working relationship not only helps minimize caregiver distress and improve satisfaction with treatment, but also decreases agitation and anxiety in the patient.<sup>40</sup>

At or soon after admission, the health care team, including the admitting physician, should meet with the patient and the family to answer questions and provide information about quitting tobacco and treatment options. The health care team can help family members by educating them to use strategies to reduce behavioural disturbances and promote tobacco cessation.

## MODIFYING THE ENVIRONMENT

People with clinically significant degrees of cognitive impairment, particularly to their executive functions, are unlikely to be able to carry out actions, sustain effort or learn new behaviours.<sup>30</sup> For such persons, smoking cessation programs that rely heavily on the individual to regulate his or her smoking behaviour independently, without considerable external support, are liable to produce poor outcomes.<sup>37</sup>

When an individual has an impaired ability to regulate his or her own behaviour, considerable assistance from others (e.g., health professionals, family, guardians) and environmental structures (e.g., modifying the environment to make it more difficult to engage in the smoking habit) may be required.<sup>37</sup> Depending on the cognitive capabilities of the individual, there may be an increased need to focus on the environmental factors that contribute to the addictive behaviour. Effective strategies include

- removing triggers and environmental cues of tobacco use
- washing all clothes of a smoker as soon as they come into the care setting to eliminate the smell of tobacco, which could trigger the urge to smoke in patients and staff who use or have previously used tobacco
- removing visual cues from the environment (e.g., seeing others using tobacco, being in an area where patients would have used tobacco before quitting)<sup>38</sup>

## ADDRESSING PERSEVERATION AND AGITATION

One of the most overwhelming aspects of caring for a person suffering from dementia involves the accompanying behavioural problems of perseveration and agitation. Patients with dementia will often perseverate, or repeatedly ask to use tobacco, even if they just had a cigarette. This can quickly escalate to agitation. Strategies that address the individual's needs decrease rates of inappropriate behaviours. Despite the many difficulties of conducting research in this population, a wide variety of approaches have been tried successfully. Many non-pharmacological approaches resulted in a statistically and clinically meaningful improvement in the manifestation of behaviour problems. The principles listed below, which received consistent support in the research, should be considered primary targets for future non-pharmacologic interventions:

- medical and nursing care that effectively address limitations in functioning, including pain, sensory limitations, sleep problems and limitations on autonomy (e.g., physical restraints)

- provision of social contact
- provision of meaningful stimuli or activity
- tailoring the intervention to the individual
- staff training to improve care
- reduction in stressful stimuli or increasing relaxation during care activities, including longer treatment times, in order to establish trust and rapport with the patient and explaining all procedures and activities to the patient in simple language before performing them
- providing the patient with a predictable routine (e.g., exercise, meals and bedtime should be routine and punctual)
- breaking complex tasks into smaller steps<sup>41,36,38</sup>

Redirecting or diverting the patient will often abruptly end or lessen the perseveration.<sup>36</sup> Arguing will only increase the agitation.<sup>36</sup> Change the subject and engage the patient's long-term memory, such as asking about a spouse or children or a favourite sport or hobby.<sup>38</sup> One tactic is to keep a memory book or photo album of pictures of the past.<sup>38</sup> Reinforce and remind the patient that he or she is now a non-smoker, and eventually they will believe it.<sup>38</sup> If the person asks for a cigarette, you could also try telling them they just had one.<sup>38</sup>

Using drug therapies to treat perseveration and agitation associated with dementia should only be considered when all other non-pharmacologic interventions have been exhausted.<sup>36</sup> When drug therapy is necessary, psychosocial interventions should continue, as they may enable a reduced dosage or duration of the drug treatment.<sup>36</sup>

## CESSATION MEDICATIONS

Evidence indicates that the use of pharmacotherapy on its own doubles the chance of success for those attempting to quit tobacco use.<sup>20</sup> Nicotine withdrawal may be more severe in patients with dementia because of their pre-existing cholinergic deficit.<sup>42</sup> This highlights the importance of using cessation medications to reduce signs and symptoms of nicotine withdrawal. Except in the presence of contraindications, it is recommended that available treatments be used with all patients attempting to quit smoking.<sup>21,20</sup> As drugs are known to metabolize differently in the elderly, when adding any pharmacotherapy you should always adhere to the general guidelines of "start low and go slow." Start at the lowest possible dose and increase doses slowly to prevent side effects and toxicity.

The first-line smoking cessation medication options approved for use in Canada include various forms of nicotine replacement therapy (NRT), bupropion SR and varenicline, which are outlined in Chapter 9 ("Pharmacotherapy"). Decisions about whether to use pharmacotherapy, including the type of product appropriate, should be made in collaboration with the patient/client and his or her family.<sup>43</sup>

While most cessation medications would presumably work in patients with dementia, it is important to note that some may be better suited to an individual with cognitive impairment than others. For instance, learning to use a nicotine inhaler may prove to be a challenge. Nicotine withdrawal in patients with dementia may be easily managed with transdermal nicotine replacement therapy.<sup>42</sup> Weatherall (1992) reported a case of a 69-year-old male with dementia for whom the use of a transdermal nicotine patch led to a dramatic and almost complete cessation of demands for tobacco use, allowing the care team to instead focus on treatment of other health concerns.<sup>42</sup>



# ANXIETY DISORDERS

## Prevalence

The prevalence of tobacco use is higher among individuals with anxiety disorders than in the general population. The percentage of current smokers who also suffer from an anxiety disorder varies according to the disorder, from 31% for social phobia, 54% for generalized anxiety disorder, to 66% for post-traumatic stress disorder.<sup>3</sup> On average, persons with anxiety disorders smoke for longer, which exposes them to a greater risk of tobacco-related harm.<sup>44</sup> The association between tobacco use and anxiety disorders may be due to shared common predisposing factors (e.g., genetic predisposition), neurobiological mediators or a tendency to experience negative affect states.<sup>45</sup> Generalized personality-based factors may be relevant to the relationship between panic attacks and smoking, but it is unclear whether specific individual differences (e.g., anxiety sensitivity) or social-environmental factors play similar roles.<sup>45</sup>

## Treatment considerations

In one study, participants who smoked and were identified as ever meeting criteria for a panic attack, social anxiety or generalized anxiety disorder reported higher levels of nicotine dependence and pre-quit withdrawal symptoms.<sup>46</sup> Participants received six 10-minute individual counselling sessions and either single-agent pharmacotherapy (nicotine patch, nicotine lozenge, or bupropion SR) or combination pharmacotherapy treatment (nicotine patch and nicotine lozenge, or bupropion SR and nicotine lozenge).<sup>46</sup> Those ever meeting criteria for panic attacks or social anxiety disorder showed greater quit-day negative affect and were less likely to be abstinent at 8 weeks and 6 months after quitting.<sup>46</sup> They did not show benefits from single-agent pharmacotherapy or combination pharmacotherapy treatment.<sup>46</sup> It could be argued that anxiety disorders and life circumstances surrounding these individuals justify a higher level of support in order to achieve equitable outcomes.<sup>44</sup>

Medications to reduce anxiety (anxiolytics) may help smokers trying to quit, but there have not been an adequate number of trials, and the available evidence neither supports nor rules out an effect of anxiolytics such as buspirone, diazepam, meprobamate, ondansetron and beta blockers on smoking cessation.<sup>47</sup> In view of this uncertainty and the side effects of these drugs, there is little justification for using them for the purposes of smoking cessation.<sup>47</sup> Clonidine, a drug that has some anxiolytic effects, does show evidence of efficacy, but the incidence of side effects from its use is relatively high.<sup>47,48</sup>

# DEPRESSION

## Prevalence

Tobacco use and depression are strongly connected. People with depression are about twice as likely to be smokers as individuals who are not depressed.<sup>1,3</sup> Tobacco use and depression may be associated through the following mechanisms: shared genetic factors, shared environmental influences, bidirectional causality and self-medication.<sup>49</sup>

## Treatment considerations

Compared to people in the general population who smoke, those with depression are more nicotine dependent and more likely to suffer from negative mood changes after nicotine withdrawal.<sup>49</sup> Their withdrawal symptoms should therefore be monitored closely. Several tools are available to simplify depression screening and enhance routine inquiry about mental health problems related to depression, which are the most prevalent and treatable mental health conditions. There is strong evidence for the use of the Personal Health Questionnaire-2 (PHQ-2) as a brief depression screening measure. The PHQ-2 assesses the frequency of depressed mood and the absence of pleasure over a 2-week period. Total PHQ-2 scores range from 0 to 6, with a score of 3 as the optimum. A score of 3 or higher indicates that the user should be referred to a mental health specialist.<sup>50</sup>

To address potential patient/client safety concerns, those who report a past history of clinical depression or currently report a moderate to severe depressed mood should be screened further to determine whether referral for mental health support is required.

It is often thought that smokers with depression do not want to quit smoking. In fact, several studies show the opposite.<sup>49</sup> Unfortunately, smokers with depression are not often encouraged by health professionals to quit, due to the misconception that cessation will exacerbate their depressive symptoms.<sup>49</sup> Evidence now suggests that quitting smoking may improve rather than exacerbate depressive symptoms in those who are able to remain abstinent.<sup>49,51</sup> Furthermore, research shows no differences in cessation outcomes as a function of the type of depression (recurrent versus single episode), the severity of depression, or whether the depression was current or in remission.<sup>52</sup>

Evidence suggests that adding a psychosocial mood management component to a standard smoking cessation intervention increases long-term cessation rates in smokers with both current and past depression when compared with the standard intervention alone.<sup>49</sup> Bupropion SR, with or without NRT, may be an appropriate choice for cessation support for those suffering from or with a history of depression.<sup>49</sup> A recent review found pooled results from four trials, suggesting that the use of bupropion may increase long-term cessation in smokers with a history of depression.<sup>49</sup> Unfortunately, there was not enough evidence to evaluate the effectiveness of the other antidepressants in smokers with current or past depression.<sup>49</sup>

### PHQ-2<sup>50</sup>

Over the past two weeks, how often have you been bothered by any of the following problems? (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day)

1. Little interest or pleasure in doing things
2. Feeling down, depressed or hopeless

# SCHIZOPHRENIA

## Prevalence

Tobacco use among individuals with schizophrenia is significantly higher than in the general population, with prevalence estimated to be between 58% and 88%.<sup>3</sup> Several biological, psychological and social factors appear to contribute to these high rates of tobacco use and dependence and the low rates for smoking cessation in persons with schizophrenia. Nicotine transiently improves abnormalities in sensorimotor gating and visuospatial working memory (VSWM) for individuals with schizophrenia.<sup>45</sup> Smoking may therefore be a form of self-medication for psychological symptoms; however, it may also be explained by addiction, dependence, tolerance or self-medicating nicotine withdrawal.<sup>45</sup> Psychosocial factors are also important in understanding the high rates of tobacco use in people with schizophrenia. Social factors that increase smoking risks for this population include limited education, poverty, unemployment, peer influence and the mental health treatment system.<sup>45</sup>

## Treatment considerations

Similar to smokers with other psychiatric disorders, about half of individuals with schizophrenia are heavy smokers and have higher nicotine dependence.<sup>45</sup> Studies that compared heavy and lighter smokers in this population found that heavy smoking was associated with increased positive symptoms, decreased negative symptoms, increased substance use, more frequent psychiatric hospitalizations, fewer parkinsonian or extrapyramidal side effects, increased suicide risk and polydipsia.<sup>45</sup> Studies have shown that clients do not show worsening symptoms of schizophrenia during periods of tobacco abstinence or while stopping smoking.<sup>11</sup> There is some evidence to suggest that people with schizophrenia may experience more severe withdrawal symptoms during the first week of a quit attempt than other would-be quitters.<sup>11</sup>

Individuals with schizophrenia appear to be able to quit tobacco with the support of psychosocial treatment, tobacco cessation medications and social support.<sup>45</sup> Although many of these patients experience difficulties and may relapse, they are still interested in reducing their smoking.<sup>45</sup> The initial challenge is often to motivate individuals with schizophrenia to attempt quitting. Engaging less-motivated patients with psychosocial interventions is important, given the high rates of tobacco dependence. One study found that motivational interviewing with personalized feedback is effective in motivating 32% of smokers with schizophrenia to seek smoking cessation treatment within one month, compared with 11% among those receiving an educational intervention and 0% among those provided with information only.<sup>54</sup> Participants received a single motivational interviewing session that lasted approximately 40 minutes and concluded with advice to quit smoking and with a referral for treatment to a specialized tobacco dependence treatment program.<sup>53</sup> Personalized feedback based on the assessment interview was provided using a form created by a computerized program.<sup>53</sup> A major goal of the feedback was to create a discrepancy between the participants' current behaviour and their future goals. Feedback included graphical representations of participant responses, including

- their level of nicotine dependence as compared with normative data
- the amount of carbon monoxide in their expired breath as compared with non-smokers
- the medical consequences of smoking
- the money spent on cigarettes
- the importance of quitting smoking
- their confidence in their ability to quit<sup>53</sup>

Motivational interviewing is effective in motivating smokers with schizophrenia or schizoaffective disorders to seek tobacco dependence treatment and may also have implications for smokers with schizophrenia who are already being treated for tobacco dependence. It can allow those individuals to become more engaged in treatment, thereby improving retention rates and treatment outcomes.<sup>53</sup>

Once a person is ready to quit, there are clinical studies showing that different intensities of psychosocial treatment interventions have been effective.<sup>45</sup> This includes one-to-one and group-based counselling, using interventions tailored to the population, cognitive-behavioural therapy approaches, social skills training and contingency monetary reinforcement.<sup>45</sup>

Pharmacotherapy may be particularly important for smokers with serious mental illness who have high levels of nicotine dependence. Psychiatric inpatient clients who were not given a prescription for nicotine replacement therapy were more than twice as likely to be discharged from the hospital against medical advice.<sup>11</sup> Looking only at the number of cigarettes smoked by individuals with schizophrenia may be a less reliable measure of dependence, as there is evidence that these smokers take more puffs per cigarette and therefore have higher levels of nicotine and cotinine compared to individuals without schizophrenia who smoke the same number of cigarettes.<sup>45</sup> Given the high levels of dependence in individuals with schizophrenia who smoke, higher doses of cessation medications are an important treatment consideration. Higher doses of nicotine replacement therapy (e.g., 6 mg of nicotine gum) have the added benefit of improving sensorimotor gating.<sup>45</sup>

An important component of tobacco cessation treatment for persons on psychotropic medications is close monitoring of the amount smoked, cessation treatment, medication side effects and psychiatric symptoms.<sup>21</sup> As a result of the polycyclic aromatic hydrocarbons in the tar of tobacco smoke, the metabolism of psychotropic medications, as well as other psychiatric medication blood levels, can be increased in cigarette smokers due to the induction of cytochrome P-450 hepatic enzymes.<sup>54</sup> Numerous medications may be affected once a person stops smoking, including

- antidepressants (tricyclics, fluvoxamine)
- antipsychotics (clozapine, olanzapine, haloperidol)
- caffeine
- benzodiazepines (chlordiazepoxide, diazepam)
- nifedipine
- propafenone
- theophylline
- verapamil
- warfarin<sup>54</sup>

Smokers frequently need higher doses of these types of medications to have the same therapeutic effect, and thereby run an increased risk of adverse effects.<sup>2,3</sup> Clients on psychotropic medications must be reviewed by health care professionals when quitting smoking, as they may need their medication dosages adjusted in order to avoid drug toxicity due to increased drug levels in their blood.<sup>55,21</sup>





# SUBSTANCE USE DISORDERS

## Prevalence

Clients in treatment for substance use disorders have extraordinarily higher rates of tobacco-related health problems than the general population, as approximately 75% to 80% of clients in substance abuse treatment settings use tobacco.<sup>3</sup> Addiction to tobacco appears to follow the same biochemical and behavioural processes as those that determine addiction to other substances. In fact, heavier smoking is linked to increased drug and alcohol use severity.<sup>2</sup>

Current tobacco use is strongly associated with abuse/dependence on alcohol, cannabis and other substances.<sup>56,57</sup> Former smokers have higher rates of alcohol-use and cannabis-use disorders.<sup>57</sup> Because of the frequent concurrent use of the two drugs, substances of abuse and smoking may become associated through a process called cue conditioning.<sup>58</sup> In general, conditioning models of addiction suggest that cues previously paired with drug use (e.g., the sight of a liquor bottle or the smell of a lighted cigarette) will elicit conditioned responses, including cravings and associated physiological activity.<sup>58</sup> These cue-elicited cravings and physiological reactions, in turn, can motivate ongoing drug use and increase the probability of relapse among people who are abstinent.<sup>58</sup> The substantial overlap between substances of abuse and tobacco use cues may elicit cravings and consumption of either drug.<sup>58</sup>

## Treatment considerations

Evidence indicates that tobacco use interventions, including counselling and medication, are effective in treating smokers who are receiving treatment for other substance use and addictions.<sup>20</sup> Counsellors and agencies providing substance abuse treatment have traditionally ignored their clients' tobacco use, even though studies consistently show that many clients want to quit and want help in quitting. A growing body of evidence indicates that treating tobacco use actually helps clients address their alcohol and other drug problems, and integrating tobacco treatment into mainstream substance abuse treatment is rapidly becoming best practice.

Substance abuse counsellors have considerable knowledge and skills about how to help clients deal with their use of addictive substances. These are directly applicable to treatment of tobacco. However, counsellors should be educated about the addictive properties of nicotine and receive training specifically about tobacco treatment.<sup>10</sup> There is some evidence that treatment outcomes improve when multiple types of clinicians are involved in tobacco treatment.<sup>2</sup> For example, one counselling strategy is to have a medical/health care clinician deliver messages about health risks and benefits, as well as deliver pharmacotherapy, while behavioural health clinicians deliver additional interventions, such as cognitive behavioural therapy. Persons who do not participate in many activities may become bored and smoke more to keep themselves busy. Recreation therapists could offer additional programming and supports in place of the time clients would have otherwise spent using tobacco.

Smokers with a history of alcohol problems may find nicotine more reinforcing, and experience more nicotine dependence criteria and withdrawal symptoms compared with smokers without alcohol problems.<sup>2</sup> In health care settings, all patients should be given access to a safe and comfortable detoxification from tobacco, as is done with other addicting substances, to prevent the emergence of nicotine withdrawal symptoms.<sup>11</sup> Pharmacotherapy should be considered for all clients to mitigate their nicotine withdrawal symptoms, especially in settings that restrict or prohibit tobacco use.<sup>21,20</sup>

Increasingly, research suggests that tobacco treatment does not jeopardize recovery from other substances. In fact, it may improve outcomes for the treatment of other substance use disorders.<sup>2</sup> A review of tobacco treatment interventions for individuals with substance abuse problems found that smoking cessation interventions were associated with a 25% increased likelihood of long-term abstinence from alcohol and illicit drugs.<sup>16</sup> Tobacco cessation supports recovery from other addictions and is associated with improved sobriety from other addictions, whereas continued tobacco use is associated with worse drug treatment outcomes.<sup>7</sup> Tobacco dependence interventions during addictions treatment appear to enhance, rather than compromise, long-term sobriety.


Both individual and group counselling are effective treatment options for treating tobacco use. Evidence also supports the use of motivational interviewing in substance use treatment settings.<sup>59</sup> The type of counselling offered can be selected based on what fits best within a care setting and for the type of clients seen at a particular facility. More intensive interventions are more effective than less intensive interventions and should be offered whenever possible. The U.S. guidelines (2008) define intensive interventions as having a minimum of four face-to-face sessions.<sup>20</sup> Self-help interventions, such as giving clients pamphlets or lists of community resources, appear to have a limited impact on their own; however, tailored materials that address specific issues and concerns can be useful additions to behavioural interventions or pharmacotherapy.<sup>10</sup>

Relapse to tobacco use following treatment for substance use and tobacco use is a concern.<sup>60</sup> Helping a person maintain his or her tobacco cessation is strengthened by offering follow-up support after treatment.<sup>59</sup> Follow-up telephone calls are also helpful and increase abstinence rates after discharge.<sup>59</sup>

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## APPENDICES

### Appendix 19(a) Residential Detox Workshop: Tobacco Use in Recovery

## DETOX WORKSHOP: TOBACCO USE IN RECOVERY

### PURPOSE

Awareness and information

### LEARNING OBJECTIVES

During this workshop, participants will:

- learn about the health consequences of tobacco use and the health benefits of tobacco cessation
- become aware that quitting tobacco use can help them stay clean and sober
- become aware of tobacco withdrawal and the supports and resources available to manage it while in recovery
- become aware of the tobacco cessation resources available to them on discharge

### MATERIALS

This workshop is intended to be a facilitator led group discussion. The following handouts and resources will help to facilitate the discussion:

- Big cigarette display
- AlbertaQuits cost savings wheel
- AlbertaQuits brochure
- AlbertaQuits fax referral sheet
- Carbon Monoxide Monitor




### PREPARATION

1. Read through the workshop.
2. Familiarize yourself with the Carbon Monoxide Monitor.
3. Assemble documents participants might be interested in.

### SUGGESTED PRESENTER

Counsellor, or nurse if available.

#### KEY

-  Suggested script
-  Questions to ask participants
-  Interactive learning activity



## Workshop overview

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This workshop is divided into 3 main topic areas:

1. Why talk about tobacco?
2. Tobacco and recovery from other addictions
3. Supports when you leave detox

During the workshop, encourage participants to share their own experiences. It's important to convey three main ideas: (1) that tobacco is very addictive, but that quitting is possible and healthy; (2) going without tobacco is an opportunity to work on new skills and give your body a chance to recover; and (3) there are supports available to help with the recovery process.

Using the phrase "tobacco use" instead of "smoking" will make sure that you are including clients who use smokeless tobacco products like snuff and chew.

*In this workshop, we will give you some information about tobacco use in recovery. We will give you information about the effects of tobacco and how it affects substance abuse. We will help you understand the supports available to you and help you make a choice that fits your situation.*

## Topic 1: Why talk about tobacco?

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### WHO USES TOBACCO?

**[Q]** *What percent of Albertans do you think currently smoke?*

In 2011, 17% of Albertans age 15+ were current smokers. (Statistics Canada, 2010)

*People with alcohol and other drug addictions have higher rates of tobacco use. In fact 75% of people with other addictions currently smoke. (Kalman, D., Baker Morissette, S., & George, T., 2005)*

**[Q]** *Why do you think more people with alcohol and other drug addictions use tobacco?*

Tobacco use often goes hand in hand with alcohol and other drug use. It's often used for many of the same reasons as other drugs. For Example: as a way to socialize with other people, to deal with stress or boredom, to get a break from a busy day. (Petry N., & Oncken C., 2002)

### WHAT'S IN TOBACCO?

*Most tobacco users know their use is unhealthy but many don't know what's really in tobacco products. Here are some facts about commercial tobacco products:*

- The tobacco products you buy in stores are very different from the sacred tobacco used in traditional native ceremonies. The tobacco industry adds many chemicals to make tobacco products more addictive. (USDHHS, 2010)

## Appendix 19(a) Residential Detox Workshop: Tobacco Use in Recovery (page 3)


Tobacco Use in Recovery 2012

- There are more than 7,000 chemicals in tobacco smoke (USDHHS, 2010). More than 69 of them are known to cause cancer. Most people already know about the harmful effects of tobacco use (USDHHS, 2010). Half of people in recovery from alcohol and drug addictions will die from a tobacco related disease (CAN-ADAPPT, 2011).

### ☐☐☐ LEARNING ACTIVITY

Use the big cigarette display to review some of the harmful chemicals found in tobacco products.

### THE GOOD THINGS ABOUT GOING WITHOUT TOBACCO

 The good news is that when you go without tobacco, your body begins to recover very quickly. Quitting is one of the best things you can do to improve your health and the health of your families and friends.

### ☐☐☐ LEARNING ACTIVITY

Ask clients to review the health benefits poster or handout. Which health benefits are the most important to them?

Within minutes of the last tobacco use, the body will start a process of healing that will continue to over the following weeks, months and years (AADAC, 2007). Within:

- 20 minutes – blood pressure drops to a person’s normal level
- 8 hours – blood carbon monoxide levels drop to normal
- 24 hours – chances of having a heart attack decrease
- 2 weeks to 3 months – circulation improves
- 9 months – lung function improves with less coughing, congestion, fatigue and shortness of breath
- 1 year – risk of coronary heart disease reduces by half
- 5 years – risk of stroke significantly reduced
- 10 years – risk of lung cancer death reduced by half
- 15 years – risk of coronary heart disease is same as a non-smoker

**[Q]** *If you did choose to remain tobacco free after leaving detox, what else would you look forward to?*

Some other benefits of stopping tobacco use include (AADAC, 2007):

- better sense of taste and smell
- cleaner smelling person, home and car
- positive role model for children and other people
- money saved
- freedom from addiction
- improved self esteem
- no worries about exposing family, friends and coworkers to second-hand smoke

### ☐☐☐ LEARNING ACTIVITY

Handout the AlbertaQuits cost savings wheel. Allow some time for clients to figure out how much they would save if they remained tobacco free.

## Topic 2: Tobacco and recovery from other addictions

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There are good reasons to be tobacco-free during detox. Nicotine is a highly addictive substance that is found in tobacco. It acts in the same part of the brain as other addictive substances (Els C., 2008). In fact, tobacco use often goes hand in hand with alcohol or other drug use. It is important to remember that the other chemicals found in tobacco are responsible for the harmful effects, not nicotine (OMA, 2008).

### WILL STOPPING TOBACCO USE IMPACT RECOVERY FROM ALCOHOL OR SUBSTANCE USE?

You might think it's too stressful for you to quit tobacco use while dealing with other addictions or you may have heard the myth that it isn't a good idea to stop using everything at once. Tobacco may trigger a relapse into alcohol or other drug use. In fact it may be easier to quit tobacco use while in recovery. Quitting smoking increases your chances of staying clean and sober from alcohol and other drugs by 25% (Prochaska, J., Delucchi, K., Hall, S., 2004).

In long-term recovery there is a higher risk of relapse if you continue to use tobacco. Because the detox facility is tobacco free, you can give yourself a better chance of staying free of alcohol or other drugs.

### WHAT TO YOU EXPECT WHEN YOU GO WITHOUT TOBACCO

It's important to understand how you will feel when you go without tobacco. Your body has become used to the effects of nicotine, and when you go without tobacco your body and brain adjust to getting rid of nicotine. This is a sign that your body is starting to repair itself. This adjustment is what we call withdrawal.

**[Q]** *When you have to go without tobacco how do you feel?*

The eight common symptoms of nicotine withdrawal are (West R., Ussher M., Evans M. & Rashid M., 2006):

- tobacco cravings
- irritability
- restlessness
- insomnia
- anxiety
- depression
- increased appetite
- poor concentration

People who stop using tobacco products either by choice or by circumstance may start to experience withdrawal symptoms within minutes to hours of last use (Abrams D., Niaura R., Brown R., Emmons K., Goldstein M. & Monti P., 2007). The good news is that there are medications and tips to help with withdrawal.

### MEDICATIONS TO HELP WITH WITHDRAWAL

Medications can at least double your chances of success. They ease withdrawal symptoms and cravings when you can't use tobacco or while you adjust to quitting.

**Nicotine Replacement Therapy (NRT)** is a proven way to ease the symptoms of nicotine withdrawal. Nicotine gum, patch, inhaler, lozenge, and mouth spray are all available in Canada. In detox, we have the nicotine patch and the nicotine lozenge available to help you. These products provide your body with less nicotine than you would get if you smoked and contain none of the other toxic chemicals that are in tobacco. It's also important to note that the nicotine from the replacement therapies takes a lot longer to get to your brain than when you smoke a cigarette or use chew. This means that there is less of a chance of you getting addicted to the medicines than to cigarettes or chew.

**Prescription Medications Champix® and Zyban®** The smoking cessation medications available in Canada are called Champix® and Zyban®. Both are nicotine free and available through a prescription from your doctor. Talk to your doctor or pharmacist for more information.

It is important to learn how to use any of these medicines properly in order for them to be effective. Read instructions carefully and talk a nurse or counsellor.

#### TIPS FOR CRAVINGS

Cravings usually last no more than 10 to 20 minutes. Some people find the following tips help them with withdrawal and cravings (Fiore M., Bailey W., Cohen S., et al., 2008) (Rogojanski J., Vettese L., Antony M., 2011):

- Drink lots of water
- Deep breathe
- Delay the urge to smoke
- Do something else to take your mind of the urge

### Topic 3: Supports when you leave detox

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#### ALBERTAQUITS RESOURCES AND SUPPORTS

In Alberta there are a number of tobacco support options that are widely available under the umbrella of AlbertaQuits.

##### □□□ LEARNING ACTIVITY

Handout the AlbertaQuits Brochure and the AlbertaQuits Helpline fax referral. Discuss the various supports available through AlbertaQuits and encourage clients that are interested in further support to complete the fax referral form.

**AlbertaQuits Helpline** is a free telephone service available from 8 am to 8 pm seven days a week for all residents of Alberta toll free at 1-866-710-QUIT (7848). They provide translation services in 180 languages. Trained Cessation Counsellors are available to help individuals develop a quit plan, deal with cravings and difficult situations, and provide ongoing support throughout their quit. Patients/clients can initiate their own contact with the helpline or healthcare providers may initiate that contact on behalf of the client/patient by completing the standard fax referral.

**AlbertaQuits Online** An internet-based quit smoking service, available free-of-charge for all Albertans. The online community is available to users 24 hours a day 7 days a week. The site provides expert advice; online peer support, quitting strategies, email reminders and more. This community can be accessed at [www.albertaquits.ca](http://www.albertaquits.ca) from any computer simply by providing a postal code to verify the user is an Alberta resident.

**AlbertaQuits Groups** Also called QuitCore, these face to face support groups that are available in certain locations across the province. They are facilitated by professionally trained leaders and attended by people looking for peer support, encouragement and advice to help them quit tobacco. The program consists of either six or eight 90-minute sessions over a period of 10 to 14 weeks and incorporates common best practices to help tobacco users quit. More information can be found at [www.albertaquits.ca](http://www.albertaquits.ca) or by calling 1-866-710-QUIT (7848).

### ADDITION TREATMENT PROGRAMS THAT SUPPORT TOBACCO CESSATION

☞ The more we learn about how tobacco use impacts recovery, the more we see tobacco supports integrated into addiction treatment. If you are thinking about giving up tobacco while you work on your other addictions, you might be interested in treatment programs that can support your tobacco cessation. A counsellor can help you decide which programs would be a good fit for you.

### STOP SMOKING MEDICINES ON DISCHARGE

☞ If you are thinking about remaining tobacco free when you leave detox, you may want to continue to use the nicotine patch or nicotine gum. A doctor or pharmacist can help you decide which will be the best option for you. Talk to a counsellor about options that might be available to help with the cost of the medications.

### Optional Topic: Carbon Monoxide Monitor

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#### WHAT IS CARBON MONOXIDE?

☞ Carbon Monoxide (CO) is a toxic, odourless, colourless, tasteless gas. When inhaled, CO competes with oxygen in the bloodstream. It binds more strongly than oxygen to hemoglobin, a molecule in your blood that carries oxygen and other nutrients to your body tissues. This starves the body tissues of the oxygen vital to repair, regeneration and general living. A simple test with a CO monitor will measure the levels of toxic carbon monoxide (CO) inhaled from tobacco smoke. This gives you an idea of how tobacco is impacting your health and body. Because CO levels return to normal quickly after quitting, if you have been in detox for a few days you will already see an improvement in your reading.

#### INFECTION CONTROL AND MAINTENANCE

Washing hands before and after testing is highly recommended for both operator and user as part of a sensible infection control regime. **NEVER** use alcohol containing hand sanitizer or cleaning products that contain alcohol or other organic solvents as these vapours will damage the sensor within the instrument. The monitor uses disposable cardboard mouthpieces that connect to the monitor via a D-piece. The disposable

cardboard mouthpieces are single-use only as re-use can increase the risk of cross infection. The D-piece contains a one-way valve to prevent patients drawing air back from the monitor. An integrated infection control filter removes and traps >99.9% of airborne bacteria.

It is preferable that the user attaches their own mouthpiece to the D-piece before the breath test, and detaches and disposed of it once the test is complete. Whilst the user is exhaling, the operator should avoid positioning themselves in front of the exhaust of the instrument.

**To clean the CO monitor**, wipe the external surfaces of the instrument with a product specifically developed for this purpose such as the instrument cleansing wipes that contain an antimicrobial liquid that eradicates dangerous bacteria in less than one minute and is laboratory proven to be effective against Norovirus, C. Diff and MRSA. It is recommended that wipes are used once and for one surface only. NEVER use alcohol or cleaning products contain alcohol or other organic solvents as these vapours will damage the sensor within the instrument. Under no circumstances should the instrument be immersed in or splashed with liquid.

### USING THE CO MONITOR

Follow these steps to take a CO reading:

1. Clean the monitor and D-piece as indicated above. Wash your hands with non-alcohol based cleanser. Attach the D-piece to the monitor.
2. Turn the monitor on by pressing and holding down on the blue button. Once the monitor is on, ensure the pointing hand symbol is pointing to the exhaling face. You can change the selection by pushing the blue button. Once you are sure the exhaling face is being pointed to, click the blue button twice quickly (like a computer mouse) to begin the breath test.
3. Have the individual who will be providing the breath sample attach their own disposable cardboard tube.
4. First explain to the individual what they will be expected to do and then double click the blue button, pass the monitor the individual and have them:
  - Immediately take a deep breath
  - Hold breath for 15 seconds as the clock on the monitor counts down
  - Put mouth around cardboard tube when the monitor begins to beep
  - Exhale completely through tube after the monitor beeps a longer beep

Breath carbon monoxide is measured in parts per million (ppm CO) and blood carboxyhaemoglobin in percentages (%COHb). The two are compatible and convertible, CO relating to lung/breath and COHb to blood gas – some monitors display both. Carbon Monoxide readings demonstrate the levels of poisonous inhaled CO in the lungs while Carboxyhaemoglobin readings show the percentage of vital oxygen that has been replaced in the bloodstream.

The cut-off points may vary depending on the CO monitor you use. Check the users guide for specific levels. Also, description of the levels that come with the CO Monitor can be difficult to interpret because they often suggest that a smoker is not addicted if their CO reading is lower than 26 which is often not the case. More meaningful interpretations are provided on in the chart below.

## Appendix 19(a) Residential Detox Workshop: Tobacco Use in Recovery (page 8)

Tobacco Use in Recovery 2012

CO Reading (ppm)	Responses to Exposure
0-2	non-smoker living in an unpolluted environment.
<10	Smokers can have readings under 10 if they have not smoked for some time or do not inhale.
16	Light smoker or smoker who has not smoked many cigarettes today. Loss of oxygen to vital organs.
32	Legal limit for 8 hour workplace exposure
54	Heavy smoker. Air pollution emergency alert.
60	Smoker who is rarely seen not smoking. Headaches, nausea, nervous system slows down, difficulty thinking clearly, vision difficulties.

### WHAT CAN AFFECT CO LEVELS?

There are several person specific and environmental factors that can impact CO level readings:

- **How deeply you inhale** A smoker may be smoking fewer cigarettes and still have higher CO readings if they are smoking more aggressively and inhaling more smoke. This effect can be offset by the use of nicotine replacement therapy (NRT).
- **Type of tobacco** Pipe or cigar smoke is much more concentrated and will give surprisingly high COHb readings.
- **Other sources of CO in the environment** High ambient levels of CO could give a higher than expected reading. It could be useful to check other family members in order to eliminate possible chronic CO poisoning (for example at home or in the car).
- **Other diseases** Lactose intolerance (an allergy to dairy products) produces hydrogen gas in the intestine. Some of this gas may be excreted via the lungs and interfere with CO readings. Alcohol can also influence CO results, such as the acetone from the breath of diabetics.
- **Marijuana** Will elevate blood CO (COHb), especially when mixed with tobacco.

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