



**Quitting**

Journée Mondiale Sans Tabac - 31 Mai

FABRICA

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**LES  
PROFESSIONNELS  
DE LA SANTE  
CONTRE LE TABAC**



## 8. Quitting Smoking and Beating Nicotine Addiction

### Introduction

Cessation of tobacco use by women worldwide must become an urgent priority to reduce the devastating effects of tobacco on the health of women and their children. Despite the warnings and known dangers of cigarette smoking and use of other tobacco products, over 5 million deaths annually are attributable to tobacco, according to the World Health Organization (WHO).<sup>1</sup> When tobacco use was predominantly a male behaviour, most of the burden of death and disability attributable to smoking fell on male smokers, as large numbers of men died of lung cancer, pulmonary and cardiovascular disease, and other tobacco-related diseases. However, the increase in women smokers over the past 30 years has made the long-term health consequences of smoking for women increasingly evident. As noted already in this monograph, lung cancer has become a significant cause of death for women worldwide and has become the leading cause of cancer death for women in the United States.<sup>2</sup>

In many countries, the majority of smokers want to quit. In a representative survey of 1750 smokers in Germany, Greece, Poland, Sweden, and the United Kingdom, 73.5% of the participants reported wanting to stop smoking.<sup>3</sup> In the United States, the demand for effective ways to reduce smoking is high: more than 70%<sup>4</sup> of smokers have expressed a desire to quit, and nearly 40% report an attempt to quit each year.<sup>5</sup> Most smokers are addicted tobacco consumers, not satisfied customers. Nearly 9 out of 10 smokers in four countries—Canada, the United Kingdom, Australia, and the United States—say they regret smoking. Women are more likely to express regret about smoking than men, and they find quitting more difficult.<sup>6</sup> The psychological, behavioural, and physical aspects of nicotine addiction make cessation difficult, leading to low rates of successful attempts to quit, despite the desire to do so and the discomfort of smoking. Policy changes and effective implementation of prevention and intervention programmes that address the needs of women smokers will be needed to increase successful and sustained cessation by women.

The importance of cessation is recognized in the WHO Framework Convention on Tobacco Control (WHO FCTC).<sup>7</sup> Article 14 of the WHO FCTC encourages Parties to implement demand-reduction measures concerning tobacco dependence and cessation, including implementing effective cessation programmes and providing counselling services.

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Tobacco use worldwide differs by gender in important ways. Prevalence rates of smoking among men have remained steady or have declined, while rates among women and girls have increased.<sup>4,8–10</sup> Thus, smoking cessation among women is a major target of tobacco control and needs to be an essential component of a comprehensive tobacco control programme in every country. Programmes addressed to women should determine whether gender-specific considerations and programming are needed.<sup>11</sup> WHO has reported that tobacco control efforts increase cessation rates. In countries of all income levels, the most cost-effective ways to decrease tobacco use are increasing tobacco taxes and creating smoke-free environments.<sup>11</sup> Other methods that have proven effective globally include bans on tobacco company advertising and sponsorship, requiring tobacco containers to have warning labels, and publicizing policy interventions. Although gender differences regarding policy efforts have not been extensively studied, WHO recommends a gendered perspective in tobacco control measures. This would mean banning tobacco companies from sponsoring events such as female-dominated fashion shows, concerts, sporting events, and social events. Because in some countries women are more likely than men to be illiterate, the use of illustrated warning labels on tobacco containers is also recommended.<sup>11</sup> This chapter offers a view of tobacco cessation with a special focus on women and their needs. Factors affecting the process of quitting for women, such as depression and weight gain, are addressed, and recommendations are provided for achieving cessation of tobacco use by women.

## Trends

The majority of smokers initiate tobacco use in their youth.<sup>12</sup> Cessation usually occurs later in life, after extensive exposure to nicotine and the injurious carcinogens and chemicals in tobacco smoke. Sustained smoking, genetic susceptibilities, exposure to other harmful substances, multiple life stresses and struggles, and social support for smoking contribute to creating and sustaining nicotine dependence. The addiction to nicotine is rooted in both physiological and psychological factors and is maintained by an environment that makes cessation difficult for both men and women. Nevertheless, quitting smoking as early as possible remains the single most effective method for decreasing risk from tobacco exposure and nicotine addiction. Surveys in many countries show that smokers can quit. In the United States, the 2006 National Health Interview Survey (NHIS) indicated that approximately 20.8% of adults (45.3 million) were classified as current cigarette smokers,<sup>13</sup> a significant decrease from the 42% rate in 1964. The majority of smokers in 1964 were males, whereas today the percentages of male and female smokers are almost equal. Most (80.1%) are daily smokers. However, the NHIS highlights the finding that more than half (50.2%, or 45.7 million individuals) of the 91 million individuals who have smoked at least 100 cigarettes in their lifetimes are now classified as former smokers. While the decline in prevalence for both men and women is encouraging, almost half of the ever-smokers in the United States continue to smoke, and approximately half of those smokers are women.

Many of the women who continue to smoke are disadvantaged from the standpoint of socioeconomic status (SES). International research has found that the SES of women smokers is relevant to quit rates. In three birth cohorts that included nearly 30 000 Italian women, those who had less than a high-school education were significantly less likely to quit smoking than those with a high-school education or more,<sup>14</sup> despite the fact that in the two older cohorts—those born between 1940 and 1959—rates of initiation were higher for women with more education. Similar inequalities have been found among women in other European countries, although shifts in the trend towards increased smoking among lower-SES groups have occurred during different decades.<sup>15–17</sup>

The inequality in cessation rates among women of different SES demonstrates a need to create specific approaches for reaching women who lack the resources to obtain traditional treatments. Federico et al. suggest that the failure to disseminate information regarding the harms of smoking in a timely and effective manner for all socioeconomic groups was one significant reason for that inequality.<sup>14</sup> In addition, tobacco companies target low-SES women with messages of achieving independence, weight loss, and stress relief through smoking.<sup>18</sup> These marketing messages are particularly effective because low-SES women often lack strong support systems and must cope with stressful or difficult living circumstances on a daily basis.

Although smoking is on the decline in many industrialized countries as a result of aggressive and comprehensive tobacco control efforts, smoking rates among women and girls are on the rise in developing countries,<sup>19,20</sup> and females in these countries have lower cessation rates.<sup>21</sup> Despite the efforts of organizations such as the Fogarty International Center ([www.fic.nih.gov](http://www.fic.nih.gov)), the Institute for Global Tobacco Control ([www.jhsph.edu/IGTC](http://www.jhsph.edu/IGTC)), the Pan American Health Association ([www.paho.org](http://www.paho.org)), and Research for International Tobacco Control ([www.idrc.ca/ritc](http://www.idrc.ca/ritc)), little research has addressed women's quitting patterns in many of these countries, partly because of limited and uncertain funding.<sup>22</sup> Therefore, most of our information is from studies in industrialized countries, although we recognize that information on women smokers in developing countries could be significantly different.

## Perspectives on Change

Determining the best way to help smokers quit is a difficult task. Recently, researchers have begun to view smokers as consumers of cessation services and are actively investigating what smokers most want when they seek help to quit. The needs and wants appear to differ among different subgroups of smokers. Weber et al.<sup>23</sup> categorized 431 smokers in a medical-care setting into three subgroups, according to demand for smoking cessation services. Those who had the highest demand for smoking cessation were more likely to report being heavy smokers, but they also had some confidence in their ability to quit and considered quitting a high priority. Interest in cessation counselling seemed to be most related to age, cigarettes smoked per

month, whether smokers were currently trying to quit, and whether they were ever told to quit smoking by a health-care provider. Successful marketing of cessation products and services requires knowledge of what would be most useful to current smokers.

The concept of consumer demand is also central to understanding the economics of the use of cessation aids. Tauras and Chaloupka<sup>24</sup> demonstrated that the demand for two types of nicotine replacement therapy (NRT) is elastic. They note that sales of NRT would increase substantially if NRT became less expensive and cigarettes more expensive. They report that a higher price for NRT reduces its use, while an increased price for cigarettes increases the demand for it, stating that a “10% decrease in the real price of NRT will increase average Nicoderm CQ and Nicorette demand by approximately 23% and 24% respectively”.

Consumer demand for tobacco products and services also differs among subgroups of smokers. Ussher, West, and Hibbs<sup>25</sup> reported that 82% of 206 pregnant women in one study wanted behavioural support, and 77% wanted self-help materials. Those wanting behavioural support strongly preferred individual sessions over group therapy. Ussher, West, and Hibbs also found differences based on employment status and race. Smokers in professional or managerial positions were less likely to prefer a “buddy” system of quitting than those in other occupations, and non-Caucasians were more likely than Caucasians to be interested in behavioural support.

It is important to note that there are strategies or treatments that lack consistent evidence, and smokers are not encouraged to use them for cessation of tobacco use. For example, there is insufficient evidence about the long-term benefit of interventions that help smokers reduce but not quit tobacco use.<sup>26</sup>

Smokers are a minority of the population, and their basic demographics and characteristics are used by the tobacco companies to target advertising programmes and promotions.<sup>27,28</sup> Tobacco control advocates and providers also need to understand how to “market” their services and products to current smokers, since smokers in many countries begin or continue to smoke despite counter-advertising and anti-smoking campaigns. Although many may want to quit, their success rates are low, and improving the sophistication of outreach and connection with current smokers is critical for successfully reducing smoking.<sup>29</sup>

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The dimensions of the process by which women quit using tobacco deserves special attention, as several factors make women’s tobacco use and the process of quitting different from those of men. For example, evidence suggests that it is more difficult for women to quit smoking and that some cessation methods are less effective for women.<sup>30</sup> Weight-gain considerations often play a greater role in the initiation and maintenance of smoking in women than they do in men. Emotional and psychological reactions, such as anxiety and depressed moods, are more likely to be related to smoking in women, and effective social support during cessation may be more relevant for women. Physiologically, women seem to have lower tolerance and an increased sensitivity to nicotine than men do, and the potential effects of the menstrual cycle on quitting success are a topic of special concern for women. This is further elaborated in the chapter in this monograph on addiction to nicotine. In addition to the direct effects of smoking on women’s health, smoking presents special health concerns for the fetus during pregnancy and for infants and children postpartum, as discussed in the chapter on pregnancy and postpartum smoking cessation.

## Models of Behavioural Change

How do individuals go about changing health behaviours? A number of theories and models have been described in the literature. These models propose that several important dimensions can be used to understand smokers and intervene with them. It is important to note that almost all theories of addiction, behavioural-change theories, and models can be used for smoking cessation.

Many of them focus on perceptions and attitudes, behaviours, intentions, and tasks that influence the modification of health behaviours. Models of change that address smoking behaviour include the widely accepted interpersonal-level behavioural-change theory—Social Cognitive Theory/Social Learning Theory—used in many group counselling programmes. The models that are reviewed below include the Health Belief Model (HBM), the Theory of Planned Behaviour (TPB), and the Transtheoretical Model (TTM).

### Health Belief Model

In the HBM, changing a health behaviour is assumed to be related to the individual's beliefs and perceptions about engaging in adopting or stopping the behaviour.<sup>31</sup> Key elements that determine whether a smoker will quit include perceived susceptibility to the consequences of smoking behaviour, perceived severity of those consequences, and perceived and actual barriers to change (e.g. costs of quitting, beliefs about efficacy of treatment), as well as perceived benefits (decreased risk, better health). In addition, cues to action that stimulate motivation and increase readiness to change must be present to initiate a change in smoking behaviour.

Tobacco treatment based on the HBM requires appropriate assessment of the smoker's susceptibility to tobacco dependency and perceived severity of smoking outcomes. *Susceptibility* includes the perceived risk of developing a health condition as a result of smoking and, if illness does develop, includes acceptance of the diagnosis and beliefs about remission and re-emergence of disease. Accurate information about risks is usually highlighted in the material provided to smokers, and education is provided to correct misconceptions. *Perceived severity* refers to a smoker's belief that smoking will cause harm and bring medical and social consequences. The combination of susceptibility and severity is often called *perceived threat*. According to this model, the probability of quitting smoking increases as perceived threat increases.

A personal cost/benefit analysis is also central to the HBM and influences the decision to quit. Chances of a quit attempt increase as the smoker's perception of the negative aspects of quitting and the personally relevant benefits increase. Maximum treatment impact requires the smoker's belief that the intervention will

be efficacious and the benefits are worth the cost of treatment. Cues to action that favour changing tobacco use, which can be internal (e.g. the presence of an illness) or external (e.g. pressure from others to quit), also motivate and may be necessary for change. Finally, confidence in the ability to abstain from smoking is viewed as essential for change.

Interventions that employ the HBM include open discussion of barriers to quitting tobacco use and attempts to develop realistic strategies for overcoming such barriers, along with help in identifying the perceived benefits of quitting, which are used as reinforcement for quitting.<sup>32</sup> Brief interventions in medical or other settings can increase perceived susceptibility and threat and also provide cues to action that are compatible with this model, as are various group and individual treatments. There are no indications of sex differences in the efficacy of using this model in cessation treatment. However, perceptions and decision considerations could be expected to differ between men and women. In one study, women perceived more risks of smoking than men but also perceived less benefit and more problems with cessation.<sup>33</sup> In another study, women reported more positive aspects of smoking, but also more negative aspects of continuing to smoke.<sup>34</sup>

Smoking is a complex behaviour, the determinants of which are often influenced by both internal factors and beliefs and external factors. The HBM focuses largely on internal determinants and may not sufficiently address all components of quitting<sup>35</sup> or the need for comprehensive cessation programming. Important factors that can be overlooked include nicotine dependence, environmental and economic factors, social norms, and peer influence. The Theory of Reasoned Action, discussed below, takes more of these factors into account.<sup>35</sup>

### Theory of Planned Behaviour

Ajzen's TPB<sup>36</sup> is a later version of the Theory of Reasoned Action first presented by Fishbein and Ajzen.<sup>37</sup> The TPB adds the variable of perceived behavioural control. It posits that three types of cognitions—behavioural beliefs, normative beliefs (subjective norms), and control beliefs (perceived behavioural control)—interact to determine an individual's intent (i.e. motivation) to initiate, and ultimately complete, a particular behaviour change.

Behavioural beliefs consist of an individual's subjective assessment of whether a desired outcome will follow a behaviour change. These beliefs, along with the subjective value of the outcomes (i.e. how desirable the outcomes are), determine the individual's attitude to the behaviour. Thus, smoking is likely to continue if smoking is perceived as having benefits and the benefits are positively valued. Change would require an increase in negative perceptions of smoking and realization of its negative outcomes (e.g. risk for illness).

Normative beliefs are smokers' perceptions of the expectations that others have regarding their behaviour. The extent to which the smoker desires to comply with the wishes of others and the strength of the desire for change determine the effect of normative beliefs on change. These beliefs form the subjective norm, i.e. the perceived social pressure to engage (or not engage) in a behaviour. If the perceived pressure from friends and family to quit is high and there are increasing environmental restrictions (e.g. implementation of clean-indoor-air laws), individuals are more likely to quit smoking, especially if they are motivated to comply with the expectations of others.

Control beliefs reflect the degree of perceived behavioural control over factors that will either facilitate or impede progress in behaviour change. If individuals' perceived behaviour control is high and their perceptions are accurate, they have the resources and skills to perform the behaviour. Thus, identifying and addressing barriers to behavioural control is likely to be useful for successful change. Smokers can increase perceived control by seeking the encouragement and resources needed to increase their sense of control. These can be obtained from behavioural interventions, self-help materials, or quit lines. Possible strategies to increase perceptions of control, described by Bandura,<sup>38</sup> include setting smaller, realistic goals on the path to the desired change. For smokers, a realistic goal might be reducing the number of cigarettes smoked per day. The goal of this strategy is to increase the sense of mastery. Other ways to increase perceived control include observing the successes of others and using relaxation techniques to manage negative feelings related to quitting or symptoms of withdrawal.

Behavioural, normative, and control beliefs interact to produce the construct of intention, which reflects a person's readiness to perform a given behaviour. Intention,

in addition to actual behavioural control, can then predict the desired behaviour. Thus, if an individual has a positive attitude to the change (e.g. I think that quitting smoking is a good idea), a subjective norm that endorses a behaviour (e.g. others will be happy if I quit), and high perceived control (e.g. I have the necessary resources to quit), then the intent and motivation to quit smoking is expected to be strong, and the likelihood of success is high.

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Research on smoking behaviour using the TPB has focused on whether the model can predict intention to smoke. Hanson<sup>39</sup> found that among Afro-American adolescent females, attitude, subjective norms, and perceived behavioural control predicted their intention to smoke, with perceived behavioural control the strongest predictor. Among Puerto Rican and non-Hispanic white adolescent girls, attitude was the strongest predictor of smoking behaviour; attitude and perceived behavioural control were also predictors, but subjective norms were not. Of the three groups, non-Hispanic white girls had the strongest intention to smoke, which would hinder quitting. In another study, the TPB predicted intention to quit and actually attempting to quit among adults in a primary-care setting. However, it did not predict the length of abstinence.<sup>40</sup> In a consumer demand study, Weber<sup>23</sup> found that attitudes towards smoking and quitting, in addition to perceived effectiveness of cessation counselling, increased the ability to predict demand for cessation services better than other predictors (e.g. age or cigarettes smoked per month).

The TPB's focus on behavioural control and norms offers additional variables for use in media and cessation-focused interventions. However, the model does not include other variables that may be important in quitting, such as personality or cultural and demographic factors. And unlike the HBM, it does not consider perceived risk or susceptibility.<sup>40</sup> Nevertheless, some studies have

shown that components of the TPB predict behaviour and behaviour change.

## *Transtheoretical Model of Intentional Behaviour Change*

As the chapter on addiction to nicotine noted, the TTM<sup>41–46</sup> is a multidimensional model that attempts to integrate various behaviour-change theories. The discussion that follows focuses on its relevance to understanding the gender and sex factors influencing quitting. Research supports the notion that cessation success can be predicted by the stage of change, as advancement through the stages increases the likelihood of quitting.<sup>47,48</sup> Gender is generally not predictive of stage of change.<sup>41,47,49</sup> However, a few studies have reported sex differences in the proportion of smokers in a particular stage of change. O’Hea et al.<sup>34</sup> found that in a sample of 274 predominantly low-income Afro-American current and former smokers, significantly fewer women (37.1%) than men (51.4%) were in the maintenance stage. In addition, significantly more women than men (22.8% vs 9.7%) were in the precontemplation stage.

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Each stage of change includes tasks that, if completed adequately, can increase the likelihood of success.<sup>50,51</sup> Completing these tasks requires active coping and using experiential and behavioural processes of change. Experiential processes include consciousness raising, dramatic relief, environmental re-evaluation, self-re-evaluation, and social liberation. Behavioural processes include reinforcement management, building helping relationships, counterconditioning, stimulus control, and self-liberation. These processes are related to completion

of the tasks of the stages. Experiential processes have been found to occur more frequently during precontemplation and contemplation, while an effective transition into the action stage is associated with increased use of behavioural processes. There is some evidence that those who do not use the “right” processes at the “right” time, particularly those who do not transition from using experiential to behavioural processes when they move to the action stage, may be more prone to relapse.<sup>50</sup> A study of gender differences in these processes demonstrated that women in the contemplation stage used more experiential processes than men did. However, in other stages, process use was very similar for males and females. Differences, when found, were small and may not be clinically meaningful.<sup>52</sup>

Relapse back to smoking after a period of abstinence and recycling through the stages are expected, because of the addictive nature of nicotine and the difficulty of adequately completing all the tasks in an attempt to quit.<sup>46</sup> The stage-based approach has been used to help providers determine clients’ readiness for change and the processes that may be helpful at particular points as they move through the stages of quitting smoking and breaking the nicotine addiction. Understanding recycling puts the process of cessation into a social learning perspective that can decrease unrealistic expectations and offer long-term hope for success.

Several measures have been used as markers of progress through the stages, including decisional considerations of the pros and cons of smoking (similar to those of the HBM) and self-efficacy (the smoker’s level of confidence that he or she can abstain from smoking in a variety of situations). As was true of the experiential processes, decisional balance considerations appear to be more important in the earlier stages of change, and self-efficacy is more important in action and maintenance. One study of sex differences on these markers found that women identified significantly more favourable aspects of smoking than men did ( $P < 0.0001$ ). They also identified significantly more unfavourable aspects, but the size of the effect was smaller ( $P < 0.05$ ).<sup>34</sup> Some research has found that women score significantly lower on measures of self-efficacy.<sup>34,47</sup>

Models provide useful frameworks for designing interventions and offer views of the process of change. However, some people see them as too rational to explain the process, which they view as chaotic, and some believe



that the models underestimate the population dynamics of smoking cessation.<sup>53,54</sup>

## Interventions

In some industrialized countries, smokers have many options among programmes, products, and techniques to choose from when planning to quit smoking. This abundance allows the individual to choose methods that seem helpful and efficacious. However, an informed decision is necessary, because some treatments are empirically supported and some are not. While some smokers seem to be able to quit with self-help materials or “cold turkey” (often used to mean completely and on one’s own), others require or opt for more-intensive interventions such as group or individual behavioural therapy. NRT and non-nicotine pharmacotherapy are also available and helpful for some smokers. Combining behavioural and pharmacological treatments may increase quitting success, particularly for heavier smokers, because they address both physiological and psychological aspects of tobacco addiction. Alternative means of quitting, such as hypnosis and acupuncture, are used by some smokers, although there is no consistent evidence to support these interventions. Finally, some cultures emphasize seeking help from professionals in tobacco cessation, while others may promote obtaining help from spiritual leaders or faith healers.

A number of empirically supported treatments and products, including the tobacco cessation interventions described below, are available to women to help them quit smoking. Different individuals are likely to have different responses to these interventions, and there is always more than one path to successful cessation. Each individual must find the way that works best for her or him to accomplish the key tasks needed to successfully change smoking behaviour. It is also important to recognize that all of the interventions may need to be adapted for particular subgroups of smokers and specific cultures or countries.

Smoking cessation requires a combination of motivation and skills. Brief interventions that use simple advice and/or motivational enhancement strategies may be sufficient to address the issue of motivation, but some smokers lack the skills or ability to manage the actual quitting and maintenance of cessation or to deal with the various cues for smoking. These individuals may need

more-intensive interventions, and significant support may be needed for them to be successful in quitting smoking. However, large numbers of smokers have been able to quit smoking on their own or with minimal assistance.<sup>55</sup> Thus, tobacco control efforts need to be multidimensional.<sup>7</sup> Although some health professionals believe and some studies indicate that women smokers who want to quit may need more support or skills-based interventions,<sup>30</sup> the data do not allow for a clear conclusion at the present time.

### *Less-Intensive and Motivational Interventions*

#### **Brief Opportunistic Interventions**

One of the early smoking cessation strategies was based on findings that smokers who received physician advice to quit had significantly better outcomes than those who did not get such advice. The Public Health Service and the Agency for Healthcare Research and Quality (AHRQ) created a protocol that established the key dimensions for addressing tobacco cessation in health-care settings. The protocol was published in the AHRQ’s Treating Tobacco Use and Dependence (TTUD) clinical practice guideline<sup>56,57</sup> and has been recommended for all health-care providers who have the opportunity to address a patient’s tobacco use. It has five components, known as the 5 As:

1. **Ask** the client about his or her tobacco use at every visit.
2. **Advise** the client to quit, using strong, clear, and concise language.
3. **Assess** the client’s willingness or readiness to quit, particularly in the next 30 days.
4. **Assist** the client in the quit attempt with either a brief or an intensive intervention or by referring him or her to an appropriate treatment provider.
5. **Arrange** for follow-up contact or relapse prevention.

This protocol has been disseminated widely, in part because it can be implemented in 3 minutes or less, making it attractive to busy health professionals. Although health-care providers have a general knowledge of the 5 As, adoption of the entire protocol has been sporadic.

Nevertheless, the number of smokers screened and offered at least one or two of the As (*ask* and *advise*) has increased dramatically over the past 10 years in the United States.

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AHRQ has produced another brief motivational intervention, called the 5 Rs, for clients who are ambivalent or not ready to quit.<sup>57</sup>

1. **Relevance:** Provide information that is relevant to the client's situation, environment, and individual needs (e.g. health status, culture, and gender). Ask the client to identify how quitting is personally relevant and important for loved ones and encourage her or him to be as specific as possible.
2. **Risks:** Ask the client to identify the short- and long-term negative effects of tobacco use, focusing on those that are personally relevant.
3. **Rewards:** Ask the client to identify the benefits of quitting tobacco use, highlighting those that are most personally relevant (e.g. better health for self and family, money saved, improved self-esteem).
4. **Roadblocks:** Help the client identify obstacles to quitting, such as withdrawal symptoms, weight gain, friends and family who smoke, fear of failure, or lack of support. Discuss how to problem-solve or overcome these barriers.
5. **Repetition:** At every contact with smoking clients, address the 5 Rs. Remind them that many smokers need to make several quit attempts before they succeed. This information can be reassuring and can motivate them to try again.

The use of these protocols has been adopted and encouraged by practitioners in the United States and

around the world in internal and family medicine, obstetrics and gynaecology, cardiology, pulmonology, and other subspecialties.<sup>56-59</sup> A Cochrane review of 39 studies found that brief physician advice to quit smoking produced cessation rates statistically significantly higher than those of smokers who received no advice (odds ratio (OR)= 1.74, 95% confidence interval (CI) = 1.48, 2.05).<sup>58,60</sup> Such advice has been shown to achieve double or triple the success rate of smokers who receive no assistance from a provider.<sup>56,57</sup> Orleans and Alper<sup>61</sup> estimate that physician interventions have the potential to raise long-term cessation rates from 7% to 30% among smokers trying to quit on their own. In the United States, limited coverage for cessation interventions, limited reimbursement for physician time, and limited understanding of billing codes for smoking cessation are three of the top six barriers to providing cessation services. Limited coverage has been cited by 54% of physicians, limited reimbursement has been cited by 52%, and lack of billing-code knowledge has been cited by 36%. Although it has been difficult to increase health-care providers' participation in cessation interventions, the recent trend of health insurance companies to reimburse for smoking interventions may encourage providers to integrate these services into standard care.<sup>62</sup>

### **Motivational Interviewing and Enhancement Protocols**

Enhancing an individual's desire to change smoking behaviour can be a daunting task. Intensive group treatment is seen as the primary way to help smokers quit, and both the American Cancer Society and the American Lung Association have created group programmes that use cognitive and behavioural principles and strategies to promote smoking cessation. Brief motivational approaches began to be used in the late 1980s and early 1990s in the United States. Spurred on by the development of motivational interviewing (MI) by William Miller and Stephen Rollnick,<sup>63</sup> use of brief motivational interventions became more acknowledged and widespread. For smokers in the early stages of change, MI may be a particularly helpful approach to increasing readiness to change, or tipping the decisional balance to favour changing behaviour.<sup>64</sup>

MI is a directive, client-centred approach that guides and encourages clients to think about and resolve their

ambivalence about quitting smoking or changing any behaviour. It derives from motivational psychology and is based on the belief that many individuals are ambivalent in the early stages of change. In MI, the responsibility for changing smoking is placed on the client, and the fact that the choice to change is a personal one is stressed, while confrontation and argumentation are avoided. The approach has five central principles:<sup>62,64</sup>

1. Express empathy.
2. Develop a discrepancy between the current behaviour of smoking and the desired behaviour (quitting smoking).
3. Avoid argumentation.
4. Roll with resistance.
5. Support self-efficacy.

In MI, ambivalence is described as a normal experience in quitting. Personalized feedback, reflective listening, exploring the pros and cons of change, and eliciting motivational statements such as problem recognition and concern are central to the process. Although most MI interventions are brief, not all are single-session.

Motivational-enhancement therapy<sup>65</sup> is a four-session, more-intensive intervention that uses feedback from an assessment battery to determine readiness to change, stage of change, and smoking status. It was developed for use with alcohol abusers and dependent patients, but it has also been used with smokers. Although the data on its use with smokers are limited, a number of studies have demonstrated efficacy.<sup>66</sup> Other studies, however, have shown no increase in cessation rates over those of controls, especially among women who have multiple problems, including drug abuse.<sup>67,68</sup>

### Self-Help Materials and Internet Interventions

Distributing self-help materials without any other intervention is only minimally effective for helping smokers change their behaviour.<sup>69</sup> In fact, clinical guidelines for treating tobacco use and dependence recommend treatments other than self-help options.<sup>56,57</sup> Data from a decade ago showed that about 1% to 5% of smokers in the United States were “self-changers”, quitting without any formal treatment.<sup>46</sup> More-recent studies have found that about 3% to 5% of smokers who quit unaided remain

abstinent six months later.<sup>70</sup> Research on this group indicates that quitting smoking is a slow process, with movement back and forth between stages and a variety of patterns of change over time.<sup>71</sup> Those who attempt to quit on their own are likely to use publicly available self-help materials on quitting, such as brochures, pamphlets, books, and videos.<sup>72</sup>

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*In recent years, a number of Internet smoking cessation sites have been developed to provide cessation information and support.*

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In recent years, a number of Internet smoking cessation sites have been developed to provide cessation information and support. Web sites allow smokers to enter personal information and receive messages and materials tailored to their particular needs and wants. QuitNet, for example, provides smokers with “quitting buddies” and 24-hour live discussions with other users via chat rooms, instant messaging, and message boards. A study of the QuitNet programme<sup>73</sup> found that those who logged on more often, spent more time online, visited more web pages, and used the social support options more frequently were more likely to be successful quitters than those who did none of these things. At the 3-month follow-up, the 7-day point prevalence abstinence rate was 7% when non-responders and bounced e-mails were counted as smokers. A 7-day point prevalence abstinence rate of 30% was reported for responders only. Among this group, 5.9% reported being abstinent for 30 days or more. Benefits were also observed for those who continued to smoke; for example, those smokers significantly reduced the number of cigarettes they smoked per day. Other preliminary studies have investigated the potential effectiveness of web-based cessation programmes, but Internet research is complex, and much work remains to be done. One such study measured cessation among European smokers who purchased nicotine patches, logged onto an Internet programme, and consented to participate in a study.<sup>74</sup> Those who received a tailored web-based programme had significantly higher cessation rates than those who did not (22.8% vs 18.1%). Other pilot and uncontrolled studies also show some positive results.<sup>73</sup> In addition to web sites that attempt to provide cessation

programmes, the American Cancer Society's *Guide to Quitting Smoking*<sup>3</sup> and the CDC's *You Can Quit Smoking*<sup>4</sup> are available online. Sites that are dedicated to women include Smoke-Free Families, which provides online self-help materials for pregnant smokers and those wanting to help pregnant smokers quit, and the American Legacy Foundation's Legacy for Longer Healthier Lives, which provides fact sheets specific to the history of women's smoking and the effects of smoking on women.

### Feedback and Tailored Messages

In many interventions, the strategy of gathering personal or group data and offering some type of feedback has been used to individualize the smoker's experience of the advice and materials. Providing feedback to those who want to quit smoking can be very useful, especially if the messages are tailored to incorporate personally relevant information and needs.<sup>75</sup> Feedback can be provided through many different formats (mail, e-mail, online) and can be given repeatedly to advise about progress and to support continued efforts to quit. Feedback can be used to compare current smoking to levels of smoking in a comparison group, indicating what is normative for an individual of similar age, sex, culture, and risk. Feedback also encourages self-monitoring, which can act as a mechanism for behaviour change. The intensity of feedback can vary significantly, from simple advice to quit smoking to the provision of intensive normative and comparative information that extends over a period of several months.<sup>75,76</sup> Such interventions have proved successful with smokers.<sup>77-80</sup> Among individuals who received three feedback reports at baseline, 6, and 12 months regarding changing multiple health behaviours, 25.4% moved into the action or maintenance stage for smoking cessation.<sup>77</sup> However, not all studies have found improvements in outcomes<sup>81</sup> (e.g. for pregnant women in the contemplation and action stages<sup>82</sup>).

## Intensive and Skills-Based Interventions

### Group Treatment

Group therapy can be an effective and efficient way to deliver cessation counselling. According to a recent Cochrane review of group smoking cessation, group treatment is more than twice as effective as self-help-only interventions.<sup>60</sup> Group treatments are usually led by

trained smoking cessation counsellors and typically last four to eight weeks. While the number of participants in group therapy varies, all members should have the opportunity to share personal experiences during a session. Programmes that have been created for use in the group setting by nonprofit and other organizations include the American Cancer Society's Freshstart<sup>®</sup> and the American Lung Association's Freedom from Smoking.

Group therapy provides the opportunity to learn cognitive and behavioural techniques, such as coping skills for cravings and withdrawal, how to set a quit date, how to seek out social support, and how to control environmental exposure to smoke. For the many women who report that stress and frustration are reasons for relapse, the cognitive techniques taught during group sessions may help increase coping skills to manage these triggers.<sup>56,57</sup>

In general, women are more likely than men to seek treatment or support for both physical and mental health issues,<sup>83</sup> and this seems to generalize to smoking cessation. For example, women in Copenhagen, Denmark, were more likely than men to accept invitations to participate in cessation groups (OR = 1.24, 95% CI = 1.0, 1.5).<sup>84</sup> The group intervention format offers women the opportunity to provide mutual support to one another while learning effective techniques for smoking cessation. Since women are often more comfortable and willing to share opinions and advice in a group setting than men are,<sup>85</sup> some tobacco control professionals recommend offering women-only groups.<sup>85</sup>

### Individual Counselling and Therapy

Individual counselling can produce smoking cessation rates twice those of smokers using self-help methods.<sup>60</sup> A Cochrane review found that when individual counselling is provided by a trained therapist, the odds ratio for successful cessation was 1.56 (95% CI = 1.32, 1.84). However, it indicated no difference between brief and intensive models of counselling.<sup>86</sup> The information and skills learned in individual counselling are similar to those learned in group treatment, but the content of sessions can more easily be tailored, allowing the counsellor to identify and address the client's personal stressors, effective cues and triggers, and specific withdrawal symptoms related to tobacco use. Individual counselling may also be particularly helpful for individuals suffering from co-occurring

psychological symptoms or disorders (e.g. depression, post-traumatic stress, and other anxiety disorders). Those with multiple problems may need assistance with both tobacco dependence and psychological issues. Such psychological difficulties have been shown to make abstinence more difficult and to lead to relapse.<sup>87,88</sup> Populations with various types of mental illness, particularly serious mental illness, generally have higher rates of smoking than those without such illness, and depression and anxiety disorders are more likely to be reported by women, leading to the use of tobacco as a coping mechanism.<sup>89</sup>

Women whose work or child-care schedules do not permit them to attend scheduled group meetings may also require individual counselling. Others may prefer to have one-on-one sessions for other reasons. For example, many women desire individual counselling when they are pregnant,<sup>25</sup> especially if they are hesitant to attend groups because of actual or perceived disapproval of their smoking by other members of the group.

### Quit Lines and Telephone Counselling

Quit lines and telephone counselling are becoming the largest providers of cessation services in many countries, as many local and national organizations now offer quit-line services for their citizens. Smokers who call a quit line may be offered a range of intervention options, from self-help materials and Internet support to multiple counselling sessions and pharmacotherapy. Quit lines, also known as help lines, provide free telephone support for individuals who are considering quitting tobacco use or are ready to quit; the support is easy to access and can provide contact with trained counsellors. A 2007 review of quit lines in Canada, the United States, and the United Kingdom<sup>90</sup> demonstrated their efficacy for smoking cessation. Services offered by quit lines include motivational counselling, follow-up calls from counsellors, mailed self-help materials and quit kits, recorded messages, access to pharmacotherapy, referrals to local resources for cessation, and combinations of these services. The review reported that in several studies, follow-up calls led to longer-term success rates than those achieved by single-call interventions (OR = 1.41, 95% CI = 1.27, 1.57). The number of follow-up calls necessary for maximum benefit has also begun to be studied. A Cochrane review suggested that three or more calls produce significantly better quit rates

than one or two calls, self-help materials, brief advice, or pharmacotherapy alone.<sup>91</sup> Studies in a recent meta-analysis showed minimally significant increases with additional calls (i.e. increases in quit rates of 2% or less). Another study demonstrated significant differences between groups that received three counselling calls without booster calls (8.5% quit rate) and groups that received five counselling calls with two boosters (14.1% quit rate).<sup>92</sup> Two large groups, the European Network of Quitlines (ENQ) and the North American Quitline Consortium (NAQC), are dedicated to evaluating and increasing the efficacy of quit lines.<sup>93</sup>

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*Telephone counselling is convenient in that it does not require the client to leave home. This is particularly useful for stay-at-home mothers and women who work while raising children.*

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When clients contact a quit line, trained cessation counsellors provide counselling that is tailored to the needs of the individual. During calls, clients may be helped to select a quit date and asked to think about barriers to quitting and methods of overcoming obstacles. They may also receive education about relapse prevention. Telephone counselling can be used as a stand-alone treatment or in addition to other ongoing interventions. Telephone counselling is convenient in that it does not require the client to leave home. This is particularly useful for stay-at-home mothers and women who work while raising children. A study of 1992–2006 data from the California Smokers Helpline showed that, except in 1993, significantly more callers 18 to 24 years of age were women than men. Thus, this may be a particularly appealing intervention for young adult women.

In addition to telephone conversations, text messaging on cellular phones is being used to provide cessation services.<sup>94</sup> In a New Zealand study, 1075 participants received personalized text messages on days near their quit date. Six weeks after quitting, the quit rate was 28% among those receiving the messages, but only 13% in the control group.<sup>95</sup>

## Pharmacological Interventions

The use of pharmacological aids for smoking cessation has been approved in many countries. In the United States, first-line therapies for tobacco cessation approved by the US Food and Drug Administration (FDA) include five forms of NRT, as well as the non-nicotine medications bupropion and varenicline. First-line interventions are those that have been shown to produce reliable increases in abstinence without excessive side-effects; second-line therapies include medications such as nortriptyline and clonidine. Since nicotine addiction has both physiological and behavioural components, a combination of pharmacotherapy and behavioural interventions is usually recommended, particularly for heavy smokers or smokers who have made several unsuccessful attempts to quit. Newer medications under investigation include nicotine vaccines and rimonabant, which is approved in European countries and the United States for treatment of obesity.

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### Nicotine Replacement Therapy

In NRT, nicotine is provided to the smoker in a manner other than smoking to reduce the physiological effects of withdrawal and enable the individual to break the smoking habit. A Cochrane report calculated the risk ratios from 132 studies that compared NRT to placebo or non-NRT control groups.<sup>96</sup> In 111 studies, the risk ratio of abstinence for any type of NRT was 1.58 (95% CI = 1.50, 1.66). Rates of quitting were increased by 50% to 70% when NRT was used. NRT can be delivered in transdermal patches, gum, lozenges, inhalers, nasal sprays, and sublingual tablets (not available in the United States). If one approach seems to be ineffective, there are alternatives that can fit the needs of the smoker.

When used appropriately, NRT products effectively decrease nicotine withdrawal symptoms such as irritability, anxiety, dysphoria, and restlessness. Patches provide a steady, constant amount of nicotine to the body throughout the day. Other types of NRT are delivered on an as-needed basis and, ideally, should be administered before cravings occur. Long-term use of NRT has been proposed as a relapse prevention strategy for individuals who have difficulty with cravings long after they have quit.

In an examination of whether responses to nicotine were gender-specific,<sup>97</sup> Evans and colleagues provided smokers with four different doses of nicotine patches (i.e. 0, 7, 21, or 42 mg) in four laboratory sessions. Both men and women experienced significant reductions in withdrawal after the patches were applied, and positive effects increased with higher doses. At the moment, there does not appear to be sufficient evidence of clinically important differences between men and women to guide treatment matching.<sup>96</sup>

### Non-Nicotine Medications

Originally marketed as an antidepressant, bupropion is the non-nicotine medication most commonly prescribed for tobacco cessation. According to a Cochrane review,<sup>98</sup> bupropion can nearly double smoking cessation rates. Smokers begin by taking 150 mg a day, and the dose is then increased to 150 mg twice a day. Bupropion blocks the re-uptake of dopamine, serotonin, and norepinephrine,<sup>99</sup> neurotransmitters involved with the reinforcing effects of nicotine. Since it has some antidepressant effects, bupropion is also believed to help with depressive symptoms and to prevent negative reactions to quitting and withdrawal triggering a depressive episode. This is a particularly important benefit for women, who are at increased risk for depression and frequently give depressive symptoms as a reason for relapse.<sup>100,101</sup>

Smith and colleagues<sup>100</sup> used data from a study comparing bupropion to another non-nicotine medication, varenicline,<sup>102</sup> to investigate whether bupropion was particularly helpful for women smokers in general and those who had been previously depressed. Logistic regression showed that one year after quitting smoking, men and women who received bupropion had similar abstinence rates (30.8% and 35.1%, respectively); however,

women who had been given a placebo quit at significantly lower rates than men did (10.0% and 23.4%, respectively). Gender differences were also not found in a 24-month evaluation of bupropion that was provided for 52 weeks.<sup>103</sup> Scharf and Shiffman<sup>104</sup> conducted both pooled analyses and meta-analyses of clinical trials using bupropion and found no significant gender differences regarding its effectiveness. Successful cessation was twice as likely for those taking the medication (OR = 2.49, 95% CI = 2.06, 3.00), but women smokers consistently had more difficulty quitting smoking (OR = 0.77, 95% CI = 0.66, 0.89).

Swan and colleagues<sup>105</sup> found that women given 150 mg of bupropion were far more likely to relapse within 12 months than were women given 300 mg or men given 150 mg. Risk factors for relapse for these women included not having a quit attempt that lasted longer than six months, higher perceived stress, and receipt of tailored mailings instead of telephone counselling. Persistent smoking during the follow-up period was predicted by lower doses (150 mg instead of 300 mg), younger age, smoking more cigarettes per day before treatment, the absence of a 24-hour quit attempt in the past year, and prior use of NRT. Overall, women were more likely to smoke during the first year after treatment (OR = 1.43, 95% CI = 1.13, 1.80). Similarly, Dale and colleagues<sup>106</sup> found that women were 67% more likely than men to return to smoking after they completed treatment with bupropion. Though this could lead to assumptions about the lack of effectiveness of bupropion for women, it could also simply reflect the greater difficulty women have quitting. Gender differences in predictors of relapse for women may indicate specific domains to target in relapse prevention interventions for women.

Despite the challenges to helping women abstain from smoking, bupropion may be particularly effective for women who are concerned about weight gain due to cessation. Some studies have indicated that bupropion may attenuate the weight gain associated with quitting smoking, at least in the short term.<sup>107</sup>

Varenicline provides a new option for smokers. It is an  $\alpha 4\beta 2$  nicotinic acetylcholine receptor (nAChR) partial agonist, and its efficacy is thought to be related to the way it binds to such receptors, causing the release of neurotransmitters (e.g. dopamine, norepinephrine, acetylcholine, and glutamate) and thereby reducing

withdrawal symptoms.<sup>99</sup> In addition, it blocks the ability of nicotine to bind to the receptors, preventing the reinforcing effects of smoking. The usual protocol calls for patients to take varenicline 7 days before their quit date, titrating up to 1 mg twice a day for up to 12 weeks. The most common side-effects, nausea and vomiting, can be reduced by taking the medication with a full glass of water and food. Other side-effects include headaches, insomnia, and abnormal and vivid dreams. In the United States, Pfizer offers individuals taking its varenicline product one year of support through its GETQUIT™ online programme ([www.get-quit.com](http://www.get-quit.com)).

Studies comparing the efficacy of bupropion, varenicline, and placebos found that varenicline produced somewhat higher short-term abstinence rates (9 to 12 weeks), though bupropion was also effective. Jorenby and colleagues<sup>102</sup> found abstinence rates of 43.9% for individuals taking varenicline, 29.8% for those taking bupropion, and 10.5% for those given a placebo ( $P < 0.001$ ). The increased benefits of varenicline continued into weeks 9 through 24, with 29.7% of subjects remaining abstinent, compared with 20.2% for bupropion ( $P = 0.003$ ) and 13.2% for placebo ( $P < 0.001$ ). Gonzales et al.<sup>108</sup> found abstinence rates of 44%, 29.5%, and 10.5% for those on varenicline, bupropion, and placebo, respectively, at weeks 9 through 12 ( $P < 0.001$ ).

Abstinence rates at or beyond 52 weeks showed that varenicline worked significantly better than placebo, but there were no consistently significant differences between varenicline and bupropion. While the Jorenby study showed continued superiority of varenicline over bupropion at week 52, Gonzales did not find a statistically significant difference between the two medications, though results favoured varenicline.<sup>102,108</sup>

### Combination Pharmacological Therapy

Though still considered a second-line approach to quitting smoking, combining pharmacological aids has been shown in some studies to be helpful, particularly for smokers who have failed to quit when using monotherapy. Combination therapy typically involves adding nicotine gum, lozenge, inhaler, or nasal spray to either the nicotine patch or bupropion.<sup>109</sup> As with all pharmacological aids, providers need to be aware of problematic side-effects and potential complications.

## Pharmacological Aids on the Horizon

Currently, three vaccines to help smokers quit are in development. The vaccines cause the body to produce antibodies, which bind to nicotine, preventing it from crossing the blood–brain barrier and thus reducing its reinforcing effects. One known drawback to the vaccines is that frequent injections are necessary to produce enough antibodies to create and maintain effectiveness. Four to 6 weeks of injections are needed to reach sufficient titers. In trials, the vaccines have performed significantly better than placebos in achieving 12-month continuous abstinence rates. The CYT002-NicQb vaccine resulted in 21% to 42% abstinence rates (placebos resulted in 21% abstinence); the TA-NIC 250–1000µg vaccine resulted in 19% to 38% abstinence rates (vs 8% for placebos); and NicVAX, which was fast-tracked by the FDA, resulted in 38% quit rates (vs 9% for placebos) in experimental trials.<sup>109</sup>

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*Using behavioural treatment in conjunction with pharmacological cessation aids has been shown to maximize success in quitting and is recommended in the Clinical Practice Guideline 2008 Update*

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Rimonabant is a medication that works by blocking the cannabinoid receptor 1 (CB1), which reduces appetite and may therefore aid in smoking cessation. The FDA has approved rimonabant as a weight-loss drug but has not approved its use for smoking cessation in the United States. A review suggests that smokers taking a 20-mg dose of rimonabant were 1.5 times more likely to quit smoking than those in a placebo group. However, rimonabant's effectiveness for maintaining abstinence is unclear. Side-effects include nausea and upper respiratory tract infections, but serious adverse effects are reportedly rare. The STRATUS-US study (of nearly 800 participants at 11 sites in the United States) reported that smokers of normal weight who quit smoking on the 20-mg dose of rimonabant did not gain the typical postcessation weight.

Additionally, obese or overweight smokers who quit tended to lose weight. However, there are recent concerns regarding increases in suicidal thoughts and depression in people taking rimonabant for weight control.<sup>110</sup>

## Combining Behavioural Therapy with Pharmacological Aids

Using behavioural treatment in conjunction with pharmacological cessation aids has been shown to maximize success in quitting and is recommended in the *Clinical Practice Guideline 2008 Update* published by the US Department of Health and Human Services.<sup>56,57,111</sup> In behavioural treatment, problems or concerns regarding treatment can be addressed with a knowledgeable professional, and compliance with the treatment regimen can be monitored to ensure that the medication is being used appropriately and the interventions are personally relevant and useful to the client. Barriers preventing the patient from successfully quitting can be addressed by making adjustments to the quit plan.

In a study of Brazilian smokers,<sup>112</sup> those receiving counselling, bupropion, and NRT had success rates at 12 months (38.5% abstinence) that surpassed the rates of those in groups with only counselling (14.5%) or counselling plus either bupropion or NRT interventions (22.8% and 25.4%, respectively). While the rates differed significantly ( $P < 0.001$ ) by intervention, there were no gender differences in cessation success rates, although a higher level of nicotine dependence was predictive of failure to quit (OR = 1.63, 95% CI = 1.13, 2.35,  $P = 0.009$ ).

Women are especially likely to benefit from combination therapy, because NRT seems to be less effective for them and psychosocial support seems to offer benefits. A multi-component approach is expected to be particularly helpful for women using NRT or those who are pregnant.<sup>111,113</sup>

## Barriers to Cessation for Women

Tobacco cessation interventions for women should be designed with particular attention to the unique barriers faced by women smokers, including depression and



depressive symptoms, fear of weight gain, hormonal and menstrual cycles, the need for social support, and increased vulnerability to relapse.

## Depression

Research has established a relationship between depression and smoking in both men and women. Smokers in general are more likely than non-smokers to have a lifetime history of depression,<sup>114,115</sup> and those with a history of depression generally smoke more and report higher levels of nicotine dependence than those who are not depressed.<sup>116–118</sup> Moreover, they have poorer abstinence rates than smokers with no history of depression.<sup>119,120</sup> Depression occurring as early as adolescence has been linked with heavy smoking in adulthood.<sup>121</sup> Because women are twice as likely as men to experience affective disorders,<sup>122</sup> negative mood and depression may be more relevant to smoking cessation in women.<sup>123</sup> A link between depression and smoking has been found in many cultures. A national study in Australia demonstrated that current smokers were nearly twice as likely as non-smokers to have had a depressive episode in the past month (OR = 1.78, 95% CI = 1.18, 2.68). Previous smokers also had a higher risk of having a depressive episode than non-smokers (OR = 1.52, 95% CI = 1.05, 2.20).<sup>87</sup> Studies have also found a link between smoking and suicide risk. In one study, smoking was associated with a twofold increase in suicide risk for smokers of more than 7 cigarettes a day. For women specifically, the risk of suicide was doubled for smokers of 1 to 24 cigarettes a day. The risk of suicide for those who smoked 25 or more cigarettes a day was four times that for non-smokers.<sup>124</sup>

Approximately 30% of individuals entering treatment for smoking cessation have a history of major depressive disorder (MDD).<sup>125</sup> Findings on the influence of MDD on smoking cessation vary, depending on the nature of the study. Cross-sectional studies have found that a history of MDD predicts lower rates of cessation,<sup>126</sup> while the findings of prospective studies of differences in cessation rates based on MDD history have been inconsistent.<sup>101,127</sup> However, one consistent finding is that a history of MDD is associated with high negative affect at treatment initiation and higher levels of negative affect while quitting.<sup>128</sup>

Levine et al.<sup>101</sup> studied women smokers with a mean age of 44.5 years and found that 52.5% met criteria for MDD at some point in their lives, a rate significantly higher than the 30% estimated to experience MDD in the general population. Participants in the study were at least moderately ready to quit smoking and moderately concerned about postcessation weight gain (i.e. ratings of 50 or higher on a scale of 1 to 100). The women who met criteria for lifetime MDD had higher levels of depressive symptoms at treatment entry, reported higher levels of nicotine dependence, and were more likely to score above 10 on the Beck Depression Inventory (34.8% with MDD vs 23.1% without MDD). However, abstinence at 3, 6, and 12 months after treatment did not differ significantly between groups. Although differences between overall rates of relapse were not significant, women with a history of MDD were more likely to relapse before treatment ended or to drop out of the study before attempting to quit (OR = 2.9, 95% CI = 0.99, 8.5). Depressive symptoms were related to abstinence after treatment—women with an increase in Beck Depression Inventory scores were significantly less likely to remain abstinent (OR = 0.80, 95% CI = 0.82–0.96). Depressive symptoms and MDD history were not related to weight changes among women who remained abstinent for 12 months.

Postcessation weight gain has been linked with an increase in caloric intake and a decrease in metabolic rate associated with quitting smoking.

Although Levine et al.<sup>100</sup> and others<sup>128,129</sup> show that a history of MDD and/or being female does not necessarily predict failure to quit smoking, other studies strongly suggest that these factors will predict greater difficulty in successfully abstaining from smoking.<sup>30,130</sup> Moreover, women with multiple episodes of MDD have been shown to have lower rates of successful cessation than women with only one MDD episode,<sup>130</sup> and NRT may not be as effective for depressed smokers.<sup>128</sup>

Women smokers with depressive symptoms as well as serious depressive disorders seem to require more extensive and intensive treatment and support, as would be true for any dual disorder. Hall and colleagues found that treatment lasting more than a year that included weekly sessions for a significant period of time<sup>131</sup> resulted in impressive success rates among women smokers who have serious depressive conditions.

## Weight Gain

For women, smoking initiation<sup>132</sup> and maintenance, as well as relapse to smoking,<sup>133</sup> are often related to concerns about expected or actual weight gain.<sup>30,134,135</sup> Smoking to influence weight begins in adolescence. A study of dieting adolescent Irish girls found that they were more than twice as likely to be smokers as those who were not dieting or attempting to lose weight.<sup>136</sup> Tomeo and Field<sup>137</sup> and French et al.<sup>138</sup> reported that smoking among adolescent girls was associated with a nearly twofold probability of dieting. Concerns about weight gain during cessation are valid, since weight gain after quitting is common among both men and women. Postcessation weight gain has been linked with an increase in caloric intake and a decrease in metabolic rate associated with quitting smoking.<sup>139</sup> Women, however, report being more concerned than men about weight gain due to quitting,<sup>133</sup> and women have been found to gain more weight than men do when they quit. Both male and female smokers in the general population who quit while participating in the Denmark Inter99 study experienced significant increases in waist circumference, body-mass index (BMI), and weight between baseline and one-year follow-up.<sup>84</sup> However, the women's increases were significantly higher than the men's. Mean changes for women in waist circumference, BMI, and weight were 4.50 cm ( $\pm 6.1$ ), 1.73 kg ( $\pm 1.7$ ), and 4.86 kg ( $\pm 4.9$ ), respectively. Women who quit smoking had more than double the chance of substantial weight gain (OR = 2.36, 95% CI = 1.3, 4.3), and the risk increased as baseline levels of tobacco consumption increased. The chance of gaining 5 kg or more increased by 5% for every additional gram of tobacco consumed. However, some studies have failed to find significant relationships between concerns about or actual weight gain and smoking outcomes among women.<sup>140,141</sup>

Ethnic and cultural considerations are important when addressing weight concerns. While women typically gain an average of 6 to 8 pounds after quitting smoking, Afro-American women tend to gain significantly more than women of other ethnicities. This is an important public health concern, as more non-Hispanic Afro-American women (35.9%) are obese than Hispanic (31.0%) or white (21.7%) women, regardless of smoking status.<sup>142</sup> Thus, Afro-American women are at higher risk of the health complications associated with smoking and obesity (e.g. cardiovascular disease), regardless of the level of smoking or psychological concerns about weight.<sup>143</sup>

## Hormonal Influences and Menstrual Cycles

Some research suggests that a woman's menstrual cycle may influence quitting. During certain phases of the cycle, symptoms of withdrawal and craving may be exacerbated. A recent review of studies of this relationship produced mixed results.<sup>144</sup> Three studies examined women who smoked ad libitum throughout the menstrual cycle, six investigated symptoms during experimental smoking abstinence, and four compared non-abstinent to abstinent women smokers. In the first group, phase of the menstrual cycle was related to increased symptoms of withdrawal, craving, or both. Symptom increases most often occurred during the luteal or late luteal phase (i.e. post-ovulation through the start of menses). In one study, irritability, restlessness, appetite change, and depressed mood—all withdrawal symptoms—were highest in the late luteal phase and were highly correlated with premenstrual symptoms, especially in this phase ( $r = 0.79$ ).<sup>145</sup> Craving was not significantly related to phase in this study, but another study found that cue-induced craving was higher for women in the luteal phase than for those in the follicular phase (i.e. start of menses to ovulation).<sup>146</sup> The findings of studies comparing abstinent and non-abstinent women smokers are fairly mixed. However, the data tend to indicate less craving or withdrawal during the follicular phase than during the luteal phase.

It is important to note that many of the studies examining the effects of the menstrual cycle on abstinence and smoking have used small samples, followed participants for a relatively brief period of time, and could have done a better job of separating out withdrawal and craving symptoms from typical experiences during menstruation. In addition, many of the studies did not have a consistent protocol concerning whether to include women with premenstrual dysphoric disorder (PMDD). In fact, a number of the studies that did not find a significant connection between craving and withdrawal and menstrual phase excluded women with a diagnosis of PMDD.

## Need for Social Support

Some research suggests that social support for quitting increases the probability of success.<sup>147</sup> This may be particularly relevant for women, as research, including a meta-analysis of 55 studies,<sup>148</sup> has shown that social support is more closely related to health in women than it is in men.

Women also seek out and use more social support when making behaviour changes.<sup>149</sup> It is not certain whether social support while trying to quit smoking affects cessation success in men and women differently, although some studies have shown that social support may be more important for women.<sup>150</sup> Pregnant women have received the most attention in this area. Two thirds of the women in one study of pregnant smokers felt that if their partner, family, or friends quit smoking, it would be easier for them to quit.<sup>146</sup> Nearly 20% of these women reported that this would be the most important contributor to their quitting while pregnant.<sup>151</sup> Another study found that the strongest predictor of relapse for pregnant women was having a partner who smoked.<sup>152</sup> Turner et al.<sup>153</sup> reported that for women of low SES who completed a brief smoking cessation intervention, the effects of depression on cessation were moderated by social support. Women who were depressed but had more social support for quitting and not smoking achieved quit at levels similar to those of women who were not recently depressed. However, some studies have found no significant differences regarding the role of social support on cessation rates for men and women,<sup>152</sup> while others have found that the effects of support are more beneficial for men.<sup>154</sup>

## Relapse

The psychological, behavioural, and physical components of tobacco dependence make relapse to smoking very common among all smokers. Relapse most often occurs within the first week of quitting,<sup>70</sup> when the symptoms of withdrawal typically peak. Those symptoms can last for weeks or months<sup>155,156</sup> and can be consistent with any of the components (psychological, behavioural, or physical) of dependence. Psychological withdrawal includes symptoms of irritability and frustration, depressed mood, anxiety, and difficulty concentrating; physical symptoms include cravings and increased appetite; behavioural difficulties include disassociating smoking from cues for smoking, such as places where one usually smoked, seeing others smoke, and times when one usually smoked.

## Summary and Recommendations

As described throughout this chapter, women seem to be less successful at quitting smoking than men. Because

women are also more prone to depression, and depression increases the risk of relapse,<sup>157</sup> this is a special concern for women. In addition, women report finding smoking more pleasurable than men do<sup>158</sup> and are more sensitive to the effects of nicotine.<sup>159</sup> Finally, women are more concerned about weight gain than men and may resume smoking to avoid it.<sup>30,132</sup> These and other, yet-undefined causes seem to be important factors that contribute to higher relapse rates among women.

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*Comprehensive approaches to smoking cessation, such as including family and partners in treatment, encouraging increases in healthy behaviours such as physical activity and healthy diets, and paying attention to the emotional and psychological needs of clients would be particularly helpful for female smokers.*

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The literature indicates that all forms of smoking cessation treatment may be effective in helping women smokers quit, but they are often less effective for women than for men. Thus, treatment that addresses topics specific to the needs of women appears necessary to optimize the effectiveness of existing interventions. Women are also most likely to benefit from combination therapies that address some of the barriers noted above. They may benefit from adjunctive treatments for weight and depression, support from peers and professionals, and specific strategies to manage cues and situations unique to women smokers.

There is little evidence that specific cessation interventions are inappropriate or counterindicated for women, with the possible exception of some pharmacotherapies, particularly for pregnant women. Therefore, a completely separate tobacco control programme for women does not appear to be indicated. However, tailoring cessation to address the specific concerns of women may be needed to increase the effectiveness of intervention efforts for

women smokers. In addition, some women smokers may prefer women-only groups, and these should be available as options.

This review suggests several specific ways to tailor cessation programming for women smokers. More extensive motivation and skills-based programming and the use of pharmacotherapy in conjunction with psychosocial treatments seem to be particularly beneficial for women smokers. Smoking cessation intervention specialists and counsellors should be trained in the needs and preferences of women smokers as part of their basic education and training. This is true for all counsellors, regardless of the type of contact they have with women smokers (e.g. whether they work through telephone or Internet contacts).

Medical settings, especially those in which a significant proportion of the patients are women, should have a state-of-the-art screening and brief-intervention component for smoking cessation, along with a network of referrals for more-intensive interventions. They should have the most current information, and their referral processes must be efficient and effective in connecting women smokers with the resources they need. The demand for creating an intervention component in medical settings is likely to be high throughout the world. In a survey pilot study, 87% to 99% of third-year health-profession students (e.g. dental, medical, nursing) in 10 countries reported that they had a responsibility to help patients quit smoking. However, only 5% to 37% received cessation training.<sup>160</sup>

Comprehensive approaches to smoking cessation, such as including family and partners in treatment, encouraging increases in healthy behaviours such as physical activity and healthy diets, and paying attention to the emotional and psychological needs of clients would be particularly helpful for female smokers. Self-help and mutual support groups may be particularly beneficial for women, providing both the material support (e.g. help with child care) and emotional support that have been identified as important for sustaining cessation.

The increase in women's smoking and the actual and potential disaster that certainly will follow for women's health increase the urgency of creating tobacco control programmes that can effectively address the unique and common challenges faced by smokers trying to break free of nicotine addiction. In addition to the policy and

environmental interventions needed in a comprehensive tobacco control programme, tobacco control specialists are called to create the types of products and services for women consumers of tobacco cessation services that will effectively meet their needs and reduce mortality and morbidity worldwide.

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World No Tobacco Day - 31 May

FABRICA

# TALK TO US BEFORE IT'S TOO LATE

If you have questions about the health effects of tobacco use, or need support quitting, health professionals can help you. Talk to them. Health professionals are doctors, nurses, midwives, dentists, psychologists, psychiatrists, pharmacists and members of other health-related professions.

[www.who.int/tobacco/health\\_professionals](http://www.who.int/tobacco/health_professionals)



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