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# Pharmacy Technicians making a difference in Tobacco Cessation Strategies

by Leslie Phillips, BSc (Pharm), Pharm D



## Learning objectives

Following completion of this lesson, the pharmacy technician will be able to assist the pharmacist in the provision of smoking cessation services by:

1. Promoting the fundamental importance of smoking cessation services through an understanding of the prevalence, morbidity, and mortality associated with tobacco use in Canada.
2. Describing and applying the 3As approach to smoking cessation...ASK, ADVISE and ACT
3. Knowing and being able to discuss general information about the efficacy, tolerability and dosing tips for first-line pharmacotherapies for smoking cessation.
4. Understanding dilemmas around the use of electronic cigarettes with respect to controversies regarding their safety, their role in smoking cessation and harm reduction, and general strategies for vaping cessation.

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**Introduction**

Pharmacy technicians are integral members of pharmacy teams. While their scope of practice may differ slightly across Canada, their primary goal is to work with patients, pharmacists and other members of the healthcare team to optimize health outcomes. Health promotion is a key competency. Pharmacy technicians promote, support, and participate in health promotion activities for patients, communities and populations in collaboration with the pharmacist.<sup>(1)</sup> Smoking cessation is the most powerful preventive intervention healthcare providers can deliver.<sup>(2)</sup> This article discusses the role that pharmacy technicians can play in helping patients change their tobacco use.

**Prevalence of Smoking in Canada**

In 2020, 12.9% of Canadians aged 12 and over identified as current smokers.<sup>(3)</sup> The Government of Canada has set a goal to reduce tobacco use to less than 5% by 2035.<sup>(4)</sup> This will require a multifaceted approach to prevent new smokers and help current smokers to quit. With their expertise and accessibility, pharmacy teams can play a vital role in meeting this target.

**The Health Consequences of Smoking**

Tobacco use is a leading cause of preventable mortality and morbidity in Canada and worldwide.<sup>(5-7)</sup>

Each day, an estimated 140 Canadians die from conditions related to tobacco use.<sup>(8)</sup> On average, one in two smokers dies prematurely from tobacco-related illness, losing at least one decade of life.<sup>(9-11)</sup> For every smoker that dies, an

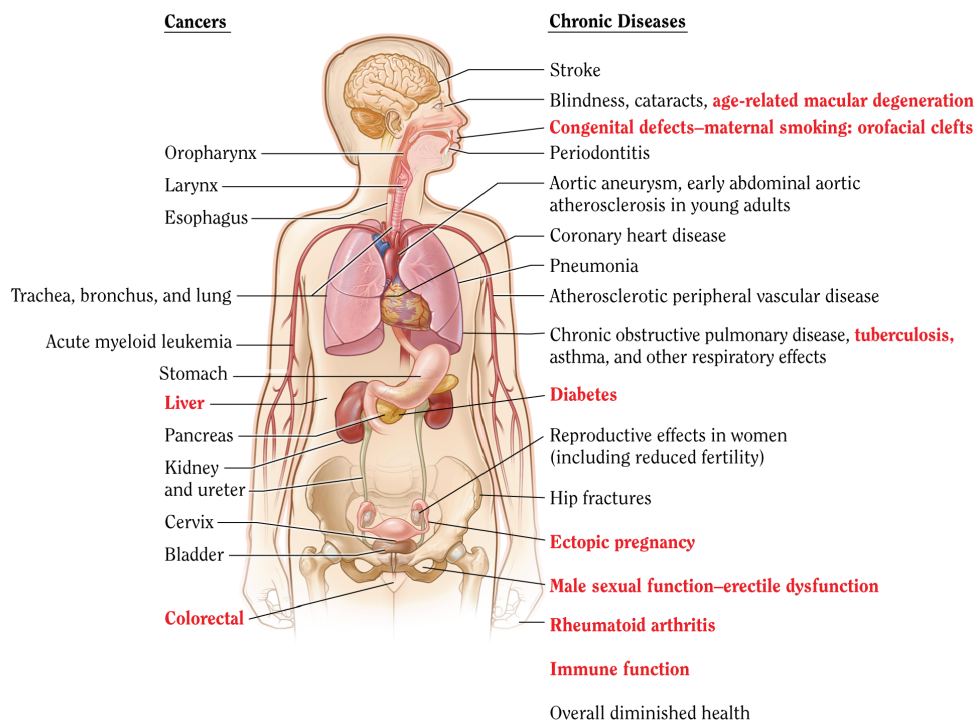
estimated 20 to 30 more (1–1.5 million Canadians) live with tobacco-related diseases.<sup>(12,13)</sup>

Smoking impacts most every organ system and is causally linked to cardiovascular

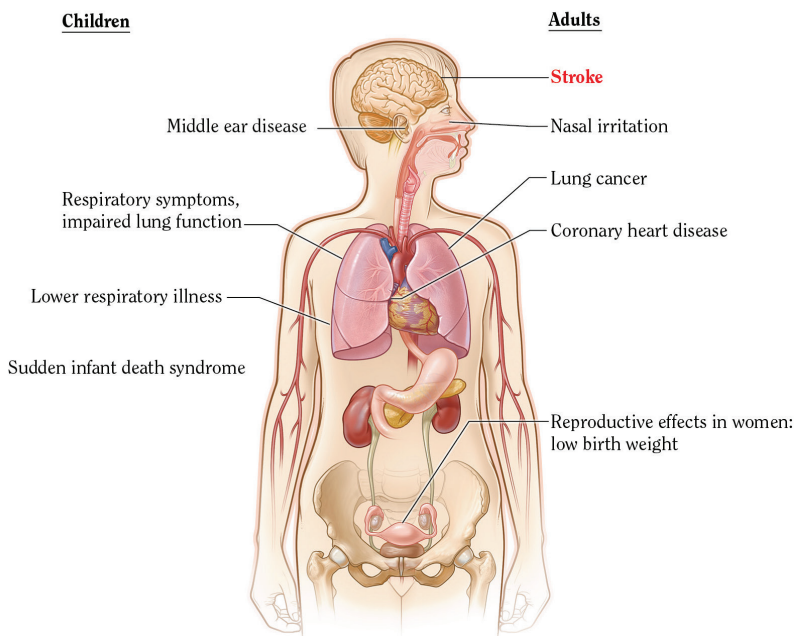
and respiratory diseases, many cancers, and many other conditions. One in three cancer deaths is caused by smoking and continued smoking increases the failure rate of cancer treatments. Smoking is responsi-

**FIGURE 1 - The Health Consequences Causally linked to Smoking<sup>(14)</sup>**

**Figure 1A The health consequences causally linked to smoking**



**Figure 1B The health consequences causally linked to exposure to secondhand smoke**



Source: USDHHS 2004, 2006, 2012.

Note: The condition in red is a new disease that has been causally linked to smoking in this report.

ble for 87% of lung cancer deaths, 32% of cardiovascular deaths and 79% of all cases of chronic obstructive pulmonary disease (COPD).<sup>(14)</sup> Second-hand smoke is also a health concern with no risk-free level of exposure.<sup>(15)</sup>

### Tobacco Cigarettes

A cigarette contains three main ingredients: nicotine, carbon monoxide, and tar. Nicotine is the addictive component. Carbon monoxide replaces oxygen in the red blood cell, reducing its delivery to muscles and organs. Tar contains around 7,000 chemicals, at least 70 of which are known carcinogens.<sup>(16)</sup> Nicotine keeps individuals smoking, but tar is primarily responsible for the morbidity and mortality associated with tobacco use.

Smoking is a powerful addiction to nicotine, not a bad habit. Dependence can start with the first cigarette and craving begins within a month of repeated administration.<sup>(17)</sup> Quitting is one of the hardest things a smoker will ever do.

Most individuals start smoking in their teenage years and 75% will continue smoking into adulthood.<sup>(14)</sup> Smoking delivers nicotine to the reward centre of the brain within 7–10 seconds, maximizing its ability to flood this network with dopamine, a feel-good chemical. The effect is short-lived and within 45 minutes of finishing a cigarette, the user starts to feel irritable, restless, and anxious. Over time, these withdrawal symptoms increase in type (e.g., difficulty concentrating, insomnia, low mood, constipation, headaches) and severity, creating a need or craving to continue smoking to keep nicotine at a level that prevents them from occurring, and the cycle of addiction begins.<sup>(18)</sup>

### Benefits of Quitting

Quitting at any age lowers mortality risk from all major smoking-related diseases. Smokers who quit before age 40 gain back 90% of the decade of life that they would have lost by continued smoking.<sup>(19)</sup>

About 62% of smokers want to quit, 45% will actually make a quit attempt, and 4%–7% will be successful on their own.<sup>(20–22)</sup> Assistance from healthcare providers, such as pharmacotherapy and behavioural support, improves the chances of success.

### Helping Smokers Quit

The 3As is a brief, systematic approach to offering smokers assistance with quitting. It

has three components, ASK, ADVISE, ACT. It does not assess willingness to quit, as did its 5As predecessor. It follows an opt-out strategy which advises smokers to quit and proactively offers assistance.<sup>(21)</sup> Pharmacy technicians can play an active role in the delivery of the 3As method.

**1. ASK** all patients if they use tobacco: Pharmacy technicians are often the first point of contact with patients and are uniquely positioned to inquire about tobacco use. As an individual's smoking status may change over time, regular inquiries should be made. It is appropriate to assess tobacco status. Tobacco use disorder is a recognised illness and healthcare professionals should screen for use and offer evidence-based treatments.<sup>(23,24)</sup> Furthermore, smoking can impact medication efficacy. Ingredients in tar induce liver enzymes, speeding up the metabolism of caffeine and some medications, potentially impacting how they work in the body.<sup>(25)</sup>

A simple approach (e.g., “We are updating everyone's files regarding their tobacco status today. Do you currently use any tobacco products?”) is usually effective. If the patient denies use, affirm their healthy lifestyle choice. If they identify as a former smoker, congratulate them as quitting is hard. If they currently smoke, the pharmacy technician can pivot to the next step.

**2. ADVISE** them to quit. This requires a delicate touch. Smokers already know smoking imparts a significant morbidity and mortality risk and don't need a lecture. Pushing an ambivalent person towards change may cause resistance.<sup>(26)</sup> Using a clear and non-judgemental manner, advise of the benefit of quitting and offer the team's support (e.g., “Quitting smoking is the most important thing you can do for your health/heart disease/COPD, now and in the future. We can help.”).

While abstinence is the primary goal and a majority of smokers are thinking about quitting, just over 25% report seriously considering quitting within the next 30 days.<sup>(27)</sup> Smokers' thoughts about quitting fall on a continuum. Some may wish to quit abruptly on a set date; some may opt to reduce how much they smoke leading to a quit date; others may decide to reduce their tobacco use without thinking about quitting or setting a date; while some may not have any

interest in changing their tobacco use at all.<sup>(28)</sup>

If the smoker gives a hard “no” to your offer to assist, let them know that your team is always ready to help. If the smoker expresses a desire to quit but doesn't feel ready or is anxious about setting a quit day, keep them engaged by advising of other options (e.g., “There are things you can do to change your smoking that don't require you to quit right away. Would you like to chat with our pharmacist about options?”). If the smoker expresses a desire to quit, but is fearful of nicotine withdrawal, advising of potential solutions might be helpful (e.g., “There are medications and other strategies that can help reduce the discomfort of nicotine withdrawal from quitting. Would you like to chat with our pharmacist about options?”). If the smoker expresses a desire to quit, but doubts their ability to do so following multiple failed attempts, a supportive statement (e.g., “Most smokers make multiple attempts before they finally quit for good. Would you like to chat with our pharmacist more about this?”) may keep them engaged.

**3. ACT** to help your team offer assistance in the form of pharmacotherapy, behavioural support, referrals, and follow-up. Patients who want to make a quit attempt can be scheduled for an appointment with the pharmacist. Most cessation services have a few key components including an initial assessment, development and implementation of a quit plan, and follow up. Pharmacy technicians can assist with the implementation of a quit service and make efficient use of the pharmacist's time and expertise.

*The Initial Assessment:* In order to develop a quit plan, the pharmacist will need information about current tobacco use, previous quit attempts, current medical conditions, medications, and lifestyle factors such as caffeine, alcohol, and cannabis use and their relationship to smoking. Pharmacies may have established programs and tools to facilitate this assessment. Pharmacists for a Smoke Free Canada has an initial assessment tool which can be printed or completed electronically.<sup>(29)</sup> Pharmacy technicians can use an assessment tool to collect required information. With the necessary background information complete, the pharmacist can quickly review and focus on formulating a quit plan with the smoker.

*Follow Up:* Once a quit plan is initiated, follow-ups help individuals stay on track.

Quit medications should be assessed for adherence, efficacy and tolerability. Queries about administration times, missed doses, and proper technique can help ensure they are being used appropriately. Asking about smoking status, slip-ups, and the frequency and severity of cravings may be used to assess efficacy. Open-ended questions about the presence of any unwanted effects, followed by more direct questions around more common or serious side effects help assess medication tolerability. The pharmacy technician can schedule and initiate follow-ups for smoking cessation. Slip-ups are commonly reported early in the quit, so check-ins within the first week and second week are a good idea so that any early problems are identified and brought to the pharmacist's attention for possible intervention.<sup>(30)</sup>

Monthly follow-ups for the first six months are helpful, but the frequency may be adjusted according to the pharmacy's service and the smoker's need. During follow-up, current smoking status and quit medication usage can be screened by the pharmacy technician and issues directed to the pharmacist. Pharmacists for a Smoke Free Canada has a follow-up tool that may be completed in part by the pharmacy technician.<sup>(31)</sup>

### Best Practices for Smoking Cessation

Behavioural counselling (enhancing problem solving skills about managing triggers, cravings, slip-ups) along with quit medication and follow-up support are the best ways to improve the odds of quitting.<sup>(21,29)</sup> Busy pharmacies may manage the quit medications and refer smokers to other programs, or online services for behavioural support.<sup>(28,32)</sup>

While some individuals quit "cold turkey," only 3%–5% remain quit at six months.<sup>(30)</sup> Individuals that use approved pharmacotherapies are two to three times more likely to quit successfully versus persons taking a placebo.<sup>(33)</sup> Table 1 lists Health Canada-approved therapies for smoking cessation. Nicotine replacement therapies (NRT), bupropion, and varenicline are considered first-line options. A natural health product, cytosine, may also be available and is discussed further below. Although some smokers may report quitting with the assistance of alternative therapies such as acupuncture, hypnosis or laser therapy, they are not recommended therapies in practice

guidelines or treatment reviews due limited scientific evidence to support the effectiveness and routine use.<sup>(21,24,28,32)</sup>

While a typical treatment course is 12 weeks, many benefit from longer durations, reflecting the chronic nature of nicotine addiction.<sup>(21,28)</sup>

As numerous factors guide quit medication selection (e.g previous quit medication history, current medical conditions and medications, affordability), a thorough pre-quit assessment by the pharmacy technician can help the pharmacist to decide which quit medications are best options.

### Nicotine Replacement Therapies

NRTs are considered "clean nicotine" as they do not contain other hazardous ingredients found in tobacco. As monotherapy, NRTs approximately double the chances of quitting.<sup>(33)</sup> They reduce symptoms of nicotine withdrawal, including cravings, by binding to nicotine receptors in the brain's dopamine reward pathway. NRTs lack the potent addictive potential of inhaled nicotine, as they supply nicotine at a slower rate to the receptor, resulting in less dopamine release and reward.<sup>(34)</sup>

NRTs come in a variety of formulations. The patch is long-acting, delivering nicotine, transdermally over 24 hours. Pharmacists have discretion to individualize therapy by recommending doses and durations of therapy that exceed product labelling. The NRT starting patch dose can be estimated as 1 mg per cigarette smoked per day or one 21 mg patch per pack of cigarettes smoked per day.<sup>(35)</sup> See Table 1 for more details on dosing. The patch can be administered pre-cessation, starting up to two weeks prior to quit day and instructing the individual to slowly reduce the amount smoked leading up to quit day. The patch can also be started on quit day. When first applied it takes a few hours for nicotine levels to climb and control withdrawal symptoms, so starting the day before or adding in a short-acting NRT may help.<sup>(36)</sup> The myth that smoking with the patch on may lead to a heart attack is still perpetuated by some and a cause of slips and relapses.<sup>(34)</sup> Individuals voicing concerns about smoking with the patch on or those who experience slips or relapse should be referred to the pharmacist for assessment and potential education around appropriate use or possible dosage adjustment. The patch dose can be adjusted as

necessary to keep the smoker comfortable, with minimal cravings. An individual who is still smoking, or experiencing significant cravings and having slips likely needs a dosage increase and should be referred to the pharmacist for review. Typically an effective dose is continued for four to six weeks and then gradually reduced (e.g., reduce by 7 mg nicotine increments every two weeks) over time, but the pharmacist may adjust therapy depending upon the individual smoker's status.<sup>(37)</sup>

Short-acting versions of NRT are absorbed buccally and include gum, lozenges, an inhaler, and oral spray. The oral spray is fastest acting with an onset of 30–60 seconds.<sup>(36,37)</sup> The other short-acting products start to work within about five minutes, peak within 30–60 minutes, and decline slowly over two to three hours.<sup>(36,37)</sup> They may be used alone or combined with NRT patches or other quit medications and used "when needed" to help manage breakthrough cravings. The combination of a patch with short-acting NRT is more effective than the patch alone, approximately tripling the odds of quitting.<sup>(33)</sup> Product choice is largely based on patient preference.

NRT products are well tolerated overall. The gum may stick to dentures and can aggravate temporomandibular joint disease. The NRT inhaler can induce bronchospasm in individuals with asthma or COPD, especially if proper technique is not employed. The gum and lozenge may help satisfy oral fixation, and the inhaler and spray have a fidget factor which may mimic the hand-to-mouth ritual of smoking.<sup>(36,37)</sup> The patch may cause some itching upon application, which usually subsides quickly. Skin irritation from the adhesive can result especially if applied to the same location every day. Insomnia and vivid dreams may occur. Tolerance usually develops in a few days to weeks. If bothersome or persistent, the patch can be removed before bed and re-applied the next morning. Without NRT overnight, the smoker may benefit from short-acting NRT for use the following morning. Mouth irritation and gastrointestinal issues, including nausea following short-acting NRT, are typically the result of improper technique resulting in ingested nicotine which binds to receptors in the gut. Signs of too much nicotine include dizziness, increased heart rate, and palpitations.<sup>(37)</sup>



**Bupropion SR**

Bupropion is marketed as an antidepressant and a smoking cessation aid. Bupropion sustained-release (SR) is the formulation

indicated for smoking cessation. The mechanism by which bupropion aids smoking cessation is unclear but is hypothesized to be related to its ability to facilitate dopamine

and block nicotine receptors in the reward pathway.<sup>(34)</sup> Bupropion approximately doubles the chances of quitting successfully.<sup>(33)</sup> It is initiated one to two weeks prior to the

**TABLE 1 - Medications for Smoking Cessation**

Medication	Suggested Regimen	Potential ADRs:	Tips/Comments	Precautions/Contraindications
<b>OTC Products</b>				
<b>Nicotine Replacement Therapies</b>				
<b>Patch</b> Long-acting	<ul style="list-style-type: none"> <li>• 1 mg NRT per each cigarette per day or</li> <li>• 21 mg per NRT per 1 ppd. Maximum 4 x 21 mg (84 mg) per day and gradually reduce</li> <li>• See PSFC algorithm for more details on dosing<sup>(35)</sup></li> <li>• Usual duration of treatment: ≥ 12 weeks</li> <li>• If using Combo-NRT, may continue short-acting product after patch has been stopped</li> </ul>	<ul style="list-style-type: none"> <li>• Local skin reactions - itch, irritation, redness, allergy to adhesive</li> <li>• Insomnia</li> <li>• Vivid dreams</li> <li>• Headache</li> </ul>	<ul style="list-style-type: none"> <li>• Can begin up to 2 weeks before quit day &amp; reduce leading up to quit day</li> <li>• Do not remove patch if you smoke<sup>(75)</sup></li> <li>• Do not remove patch before bed unless adverse effects necessitate</li> <li>• Rotate patch site daily, apply to hairless area between neck &amp; waist including arms to avoid skin irritation.</li> <li>• Avoid use if significant dermatologic conditions e.g., psoriasis, atopic dermatitis</li> <li>• Doubles chances of quit versus placebo<sup>(21,33)</sup></li> <li>• Triples chance of quitting versus placebo if combined with short-acting NRT<sup>(21)</sup></li> </ul>	<p><u>Contraindications:</u> No absolute contraindications<sup>(28)</sup></p> <p><u>Precautions:</u></p> <ul style="list-style-type: none"> <li>• Recent AMI (1st two weeks), unstable angina &amp; serious cardiac arrhythmias</li> <li>• NRT not considered a risk in patients with underlying, stable CVD<sup>(70)</sup></li> <li>• Stomach ulcer</li> <li>• Note: Risk of NRT minimal relative to the risk of continued smoking.</li> <li>• Remove patch prior to MRI, &amp; consider removing patch prior to intense exercise</li> </ul> <p><u>Signs of too much nicotine:</u> dizziness, nausea, tachycardia, palpitations, sweating</p>
<b>Gum</b> Short-acting	<ul style="list-style-type: none"> <li>• &gt; 1 ppd recommend 4 mg</li> <li>• ≤ 1 ppd recommend 2 mg<sup>37</sup></li> <li>• Chew 1 piece whenever there is an urge to smoke (usually q 1–2 hr at first) &amp; slowly reduce</li> <li>• May be combined with NRT patch or other cessation medications &amp; used prn for cravings</li> <li>• Usual duration of treatment: &gt; 12 weeks</li> <li>• If using Combo-NRT, may continue short-acting product after patch has been stopped.</li> </ul>	<ul style="list-style-type: none"> <li>• Nausea, heartburn, hiccups</li> <li>• Jaw discomfort or soreness</li> <li>• Mouth irritation</li> </ul>	<ul style="list-style-type: none"> <li>• Use proper “chew, chew, park” technique</li> <li>• Stop chewing &amp; park the gum in cheek when intense peppery/tingling sensation occurs &amp; chew again when this subsides</li> <li>• Lasts ~ 30 minutes</li> <li>• Avoid food/drink for 15 min before &amp; during use</li> <li>• Available in different flavours</li> </ul>	
<b>Lozenge</b> Short-acting	<ul style="list-style-type: none"> <li>• For the 2 and 4 mg<sup>(68)</sup> Products: &gt; 1 ppd recommend 4 mg &lt; 1 ppd recommend 2 mg</li> <li>• For the 1 &amp; 2 mg<sup>(69)</sup> Products: &gt; 20 cpd recommend 2 mg &lt;20 cpd recommend 1 mg</li> <li>• Chew 1 piece whenever there is an urge to smoke (usually q 1–2 hrs at first) &amp; slowly reduce</li> <li>• May be combined with NRT patch or other cessation medications &amp; used prn for cravings</li> <li>• Usual duration of treatment: at least 12 weeks. Longer durations may be needed</li> </ul>	<ul style="list-style-type: none"> <li>• Nausea, heartburn, hiccups</li> <li>• Mouth or throat irritation</li> </ul>	<ul style="list-style-type: none"> <li>• Use “suck, park, suck” technique</li> <li>• Stop sucking &amp; park the lozenge between cheek and gums when intense peppery/tingling sensation occurs &amp; suck again when this subsides</li> <li>• Do not chew or swallow. Move from side to side in the mouth when sucking the lozenge</li> <li>• Lozenge should dissolve in mouth in about 10 minutes</li> <li>• Avoid food/drink for 15 min before &amp; during use</li> <li>• Available in different flavours</li> </ul>	
<b>Inhaler</b> Short-acting	<ul style="list-style-type: none"> <li>• As monotherapy start with ~ 6–12 cartridges per day and slowly reduce<sup>(68)</sup></li> <li>• May be combined with NRT patch or other cessation medications &amp; used prn for cravings</li> <li>• Usual duration of treatment: &gt; 12 weeks</li> <li>• If using Combo-NRT, may continue short-acting product after patch has been stopped</li> </ul>	<ul style="list-style-type: none"> <li>• Nausea, hiccups</li> <li>• Mouth or throat irritation, coughing, if inhaled too deeply</li> <li>• Bronchospasm possible with reactive airway disease (asthma, COPD)</li> </ul>	<ul style="list-style-type: none"> <li>• Inhale using short puffs or breaths; avoid directing to back of throat</li> <li>• Cartridge provides about 20 minutes of puffing time or 80 puffs</li> <li>• Replace cartridge after 24 hr even if not completely used</li> <li>• Avoid food/drink for 15 min before &amp; during use</li> <li>• Has “fidget” factor that some smokers may like</li> </ul>	

>> CONTINUED ON PAGE 5

<p><b>Mouth spray</b> Short-acting</p>	<ul style="list-style-type: none"> <li>As monotherapy, start with 1–2 sprays every 30 min or when individual would normally smoke and gradually reduce<sup>(65)</sup></li> <li>May be combined with NRT patch or other cessation medications &amp; used prn for cravings</li> <li>Usual duration of treatment: &gt; 12 weeks</li> <li>If using Combo-NRT, may continue short-acting product after patch has been stopped</li> </ul>	<ul style="list-style-type: none"> <li>Nausea, hiccups</li> <li>Mouth or throat irritation</li> </ul>	<ul style="list-style-type: none"> <li>Fastest acting of NRT products—onset is 30–60 seconds</li> <li>Prime pump to create fine mist before 1st use &amp; may need to repeat if not used for a few days</li> <li>Strong flavour - spray to side of cheek or under tongue</li> <li>Do not spray towards back of throat, avoid lips and eyes</li> <li>Avoid food/drink for 15 min before &amp; during use</li> <li>Available in different flavours</li> <li>Has “fidget” factor that some smokers may like</li> </ul>	
<b>Natural Health Products</b>				
<b>Cytisine</b>				
	<ul style="list-style-type: none"> <li><b>Days 1–3:</b> 1.5 mg PO q2hr -6 doses/day</li> <li><b>Days 4–12:</b> 1.5 mg PO q2.5hr - 5 doses/day</li> <li><b>Days 13–16:</b> 1.5 mg PO q4hr - 4 doses/day</li> <li><b>Days 17–20:</b> 1.5 mg PO q5hr - 3 doses/day</li> <li><b>Days 21–25:</b> 1.5 mg PO q6hr - 2 doses/day<sup>35</sup></li> </ul>	<ul style="list-style-type: none"> <li>Nausea, vomiting</li> <li>Insomnia, vivid dreams</li> </ul>	<ul style="list-style-type: none"> <li>Natural Health Product</li> <li>Limited in-pharmacy availability in Canada. Available online</li> <li>Comparable quit rate to NRT monotherapy<sup>(21,33)</sup></li> </ul>	
<b>Prescription Products</b>				
<p>Bupropion SR</p>	<ul style="list-style-type: none"> <li>150 mg PO daily × 3 days then 150 mg PO BID</li> <li>May lower dose to 150 mg PO daily if needed<sup>(35,38,40)</sup></li> <li>Usual duration of treatment: at least 12 weeks. Longer durations may be needed</li> </ul>	<ul style="list-style-type: none"> <li>Dose-related seizure risk.</li> <li>Tachycardia</li> <li>Insomnia, abnormal dreams</li> <li>Restlessness, anxiety</li> <li>Treatment-emergent mania/hypomania</li> <li>Suicidality reports with antidepressant use in youth &amp; young adults</li> </ul>	<ul style="list-style-type: none"> <li>Begin 1–2 weeks before quit date</li> <li>Take breakfast &amp; supptime; avoid taking in evening to avoid insomnia</li> <li>If dose missed, do not double up – seizure risk!</li> <li>Also marketed as an antidepressant</li> <li>Strong inhibitor of CYP2D6 – significant drug interactions possible esp. with codeine, tamoxifen</li> <li>Least expensive smoking cessation therapy</li> <li>Has been associated with weight loss &amp; may reduce weight gain associated with quitting early on<sup>(21,38)</sup></li> <li>Can be used safely in CVD.</li> <li>Doubles chances of quitting versus placebo<sup>(21,33)</sup></li> </ul>	<p><b>Contraindications:</b></p> <ul style="list-style-type: none"> <li>Hypersensitivity to bupropion</li> <li>Use with MAOIs concurrently or within 14 days</li> <li>Use with thioridazine</li> <li>Uncontrolled seizures or risk for seizures such as anorexia/bulimia, abrupt withdrawal from alcohol, benzodiazepines or sedatives</li> </ul> <p><b>Precautions:</b></p> <ul style="list-style-type: none"> <li>Hepatic/Renal impairment—may require dose ↓</li> <li>Pregnancy/lactation</li> <li>Use with other medications that lower seizure threshold</li> <li>History of head trauma</li> </ul>
<p>Varenicline</p>	<ul style="list-style-type: none"> <li>0.5 mg PO daily × 3 days then BID × 4 days then 1 mg PO BID</li> <li>May lower dose to 0.5 mg PO BID if needed<sup>(35,38)</sup></li> <li>Usual duration of treatment: at least 12 weeks. Longer durations may be needed</li> </ul>	<ul style="list-style-type: none"> <li>Nausea, vomiting</li> <li>Insomnia, vivid dreams</li> <li>Previous blackbox warnings re neuropsychiatric effects removed<sup>(42)</sup></li> </ul>	<ul style="list-style-type: none"> <li>Fixed quit date: Begin 1–2 weeks before quit date</li> <li>Flexible quit date: quit between days 8–35</li> <li>Gradual quit: Reduce-to-quit over 12 weeks, continue treatment for 24 weeks</li> <li>Take with breakfast and supper, avoid taking in the evening due to insomnia risk</li> <li>Take with a full glass of water</li> <li>Triples chance of quit vs placebo<sup>(21,33)</sup></li> </ul>	<p><b>Contraindications:</b></p> <ul style="list-style-type: none"> <li>Hypersensitivity to varenicline</li> </ul> <p><b>Precautions:</b></p> <ul style="list-style-type: none"> <li>Renal Impairment—may require dose ↓</li> <li>May enhance the effect of alcohol</li> <li>Pregnancy, lactation - no information, avoid if possible</li> <li>Individuals with unstable psychiatric illness</li> </ul>

AMI—acute myocardial infarction; COPD—chronic obstructive pulmonary disease; CVD—cardiovascular disease; MAOIs—monoamine oxidase inhibitors; MRI—magnetic resonance imaging; NRT—nicotine replacement therapy; ppd—packs per day; PSFC—Pharmacists for a Smoke Free Canada; TMJ—temporomandibular joint

targeted quit day. Dosing guidance can be found in Table 1. An initial titration schedule may help to minimize more common side effects such as insomnia, dizziness, headache, anxiety, agitation, difficulty concentrating, sweating, dry mouth, nausea, and anorexia.<sup>(38)</sup>

To minimize insomnia, smokers should

be advised to avoid taking the second dose too close to bedtime (e.g., within 4-6 hours). Intolerable or persistent side effects may be managed by dosage reduction (e.g., from 150 mg twice daily to 150 mg once daily); there is evidence that 150 mg/day may also be efficacious for cessation.<sup>(39)</sup> Although rare, seizures are a dose-related risk with

bupropion and patients should not double-up on missed doses or take doses too close together. Bupropion is contraindicated in those with or at risk for seizure or in those already taking bupropion for depression or obesity.<sup>(40)</sup> This medication is a significant inhibitor of CYP2D6 and may impact the efficacy or side effect profile of medications

activated or metabolized by this enzyme.<sup>(41)</sup> Attainment of an accurate list of current medical conditions and medications by the pharmacy technician will enable the pharmacist to better determine appropriate candidates for bupropion.

### Varenicline

Varenicline acts on the nicotinic receptor but produces less dopamine release in the reward pathway than nicotine. This mechanism allows it to reduce cravings. Because it also competes with nicotine for the receptor, it helps block the reward of smoking.<sup>(34,38)</sup> It is the most effective monotherapy and triples the odds of quitting.<sup>(33)</sup> Dosing guidance can be found in Table 1. Dose-related nausea, insomnia, headache, and vivid dreams are the most common side effects. Taking this medication with a meal and large glass of water helps to minimize gastrointestinal effects.<sup>38</sup> Second doses should not be taken too close to bedtime (e.g. within 4-6 hours) to help prevent sleep disturbances.<sup>(38)</sup> Although not quite as effective as the full dose, halving the dose may alleviate these side effects if they remain bothersome or persist. Concerns related to an increased risk of neuropsychiatric effects (e.g., agitation, aggression, suicidal ideation, suicide, depression) were alleviated after a large well-designed study did not find any significant increased risk for NRT, bupropion, or varenicline compared to placebo among patients with and without stable psychiatric illness.<sup>(42)</sup>

### Cytisine

Derived from *Cytisus laburnum* tree, cytisine has been used for smoking cessation in Europe for decades.<sup>(43)</sup> It may be an alternative for individuals reluctant to take pharmaceuticals, preferring products perceived to be more natural. Cytisine works like varenicline at the nicotinic receptor.<sup>(43)</sup> While evidence is limited, the six-month quit rate appears comparable to NRT.<sup>(44-46)</sup> The current recommended treatment duration is 25 days, making it an affordable option, but the dosing schedule is complicated (see Table 1). The side effect profile is similar to varenicline with nausea and sleep disturbance being most common, but typically self-limited.<sup>(47)</sup> Cytisine has limited availability in pharmacies throughout Canada, but can be ordered online.

### Electronic Cigarettes:

Electronic cigarettes (e-cigarettes, vapes) use a battery-heated coil, to heat a solution (e-liquid or e-juice) at lower-than-combustion temperatures. They do not contain tobacco. The e-liquid usually contains a mixture of propylene glycol (theatrical fog) and glycerol which form an aerosol when heated. E-liquids also usually contain nicotine, flavourings, metallic nanoparticles such as lead, nickel and tin, and some of the hazardous chemicals found in tobacco products. Some of these compounds are added and others are formed when constituents in the e-liquid are heated. E-cigarettes may also be a delivery vehicle for other drugs, including cannabis.<sup>(48)</sup>

Vaping products which contain “nicotine salt” formulations create a more pleasant experience with less throat irritation and may encourage the inhalation of higher doses of nicotine, above amounts in tobacco cigarettes.<sup>(49)</sup> The Government of Canada recently capped maximum nicotine concentrations in e-liquids at 2% or 20 mg/mL.<sup>(50)</sup> A tobacco cigarette delivers about 1 mg nicotine to the brain or about 20 mg of nicotine per 20 cigarettes.<sup>(34,51)</sup>

With a plethora of devices and e-liquids, it can be challenging to study the benefits and harms of these products.

### Role of electronic cigarettes in smoking cessation

E-cigarettes are being used by smokers to quit, despite a lack of efficacy and safety data. While not an approved smoking cessation aid in Canada, there is evidence that some products which contain nicotine may help smokers to quit.<sup>(52-55)</sup>

However, the majority of e-cigarette users identify as “dual users” meaning they use both tobacco and e-cigarettes.<sup>(56)</sup> Dual use is unlikely to have a significant health benefit as individuals continue to use tobacco products. For smokers who are unable to quit smoking via traditional methods, switching completely to e-cigarettes may be a form of harm reduction.<sup>(57)</sup>

There is evidence that e-cigarettes can increase the risk of uptake of tobacco products in both non-smokers and former smokers.<sup>(58)</sup> Most worrisome is the significant uptake of e-cigarettes by youth and young adults.<sup>(48,59)</sup> Youth advocates warn that we are creating a whole new generation of indi-

viduals who will be addicted to nicotine and caution about the potential impacts of nicotine on a developing brain, affecting memory, learning, decision making, and priming it for future substance abuse.<sup>(60,61)</sup> Among adolescents who had no intention to smoke, e-cigarette users had almost five times the odds of cigarette smoking.<sup>(62)</sup> One study estimated that for every smoker that quit using e-cigarettes, 80 kids started using an e-cigarette.<sup>(63)</sup>

### Electronic-cigarette safety

E-cigarettes are thought to be less harmful than tobacco cigarettes, but not harmless.<sup>(64)</sup> Beyond exposure to nicotine, hazardous compounds (e.g., formaldehyde, acetaldehyde and acrolein) have been found in the aerosol. The type and quantity emitted depends largely upon the type of device and how it is used. Overall, exposure with typical use appears to be lower than with tobacco cigarettes, but little is known about what constitutes a safe level of exposure to many of these compounds. E-cigarettes are relatively new. Their long-term safety is currently unknown.<sup>(49)</sup> A recent paper estimates that modern e-cigarettes could be a third as harmful as smoking.<sup>(65)</sup>

### Electronic cigarette cessation

The majority of e-cigarette users want to quit, including youth.<sup>(66,67)</sup> There is a lack of research evidence as to how to best help them. The Centre for Addiction and Mental Health (CAMH) recently published a vaping cessation guidance resource.<sup>(68)</sup> While considered “off-label” use, any first-line options listed in Table 1 may be considered along with behavioural strategies and support. A minimum duration of 8–12 weeks of treatment is suggested.<sup>(68)</sup>

### Summary

Tobacco use remains the leading preventable cause of morbidity and mortality in Canada. Pharmacy technicians are well positioned to assist pharmacists in the delivery of smoking cessation services. They can help the pharmacist by identifying tobacco users, and assisting in the application of the 3As and the provision of quit medication and support. In doing so, technicians can make significant contributions towards improving cessation rates and the quality of life for their patients who use tobacco prod-

ucts, and reducing the public health burden of smoking.

The use of e-cigarettes is controversial. They may help some smokers quit or represent a form of harm reduction, as they are currently viewed as being safer than tobacco cigarettes. However there is also evidence that a majority of users are dual (e-cig and tobacco) users, that e-cigs may promote uptake of tobacco products in some individuals, and that youth and young adults who have never smoked are the biggest users, putting this generation at risk for nicotine addiction.

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## QUESTIONS

Please select the best answer for each question and answer online at eCortex.ca for instant results.

- Which of the following statements regarding smoking is true?
  - Smoking is the cause of 1 in 2 of all deaths in Canada
  - Smoking is the leading preventable cause of premature death in Canada
  - Quitting smoking after age 40 is not associated with any health benefits
  - On average smokers will die 20 years earlier as a result of their smoking.
  - The health consequences of exposure to second-hand smoke are unknown.
- The component of tobacco causally linked to substantive morbidity and mortality is
  - Carbon monoxide
  - Menthol
  - Nicotine
  - Propylene glycol
  - Tar
- Which of the following is NOT a component of the 3As for tobacco cessation intervention?
  - Ask: ask patients about their tobacco use
  - Assess: assess a smoker's willingness to quit
  - Advise: advise smokers to quit
  - Act: act to offer assistance with quitting
- A 63-year-old male has been getting prescriptions for diabetes (metformin) and high cholesterol (rosuvastatin) filled at your pharmacy for years. Today he presents with a new prescription for metoprolol and informs you that he had a heart attack 1 week ago. Upon questioning he advises that he currently smokes. Which of the following is appropriate to say?
  - "I can't believe you are still smoking. You need to quit right now."
  - "If you don't quit smoking, you will have another heart attack and you could die."
  - "Are you interested in trying to quit smoking?"
  - "I'm concerned that you are smoking, especially since you've recently had a heart attack. Quitting would be the best thing you could do to protect your health. Would you like to chat with the pharmacist about how we can help you quit?"
- Which of the following NRT products may cause bronchospasm if used for smoking cessation in individuals with asthma or COPD?
  - Gum
  - Inhaler
  - Lozenge
  - Oral Spray
- A smoker who has been using nicotine gum reports lightheadedness, throat irritation and nausea. Thinking about the probable cause, what do you most want to question them about before consulting the pharmacist?
  - Their chewing technique
  - Their caffeine intake
  - Their dose of NRT gum
  - Their current smoking status

7. How long does it take for inhaled nicotine from a cigarette to reach the reward pathway in the brain?
- 7–10 seconds
  - 30–60 seconds
  - 2–3 minutes
  - 5–10 minutes
  - 1–2 hours
8. Which NRT product provides a consistent level of nicotine to help prevent withdrawal symptoms and cravings?
- Gum
  - Inhaler
  - Lozenge
  - Oral spray
  - Patch
9. Which statement about NRT products is true?
- They are as addictive as nicotine from a cigarette
  - They cannot be used in persons with cardiovascular disease
  - They double to triple the odds of quitting
  - They should be discontinued for 4 weeks after the person quits
  - The patch should be removed if the individual smokes
10. Which of the following methods used for smoking cessation has the highest quit rate at 6 months?
- Bupropion SR
  - Cytisine
  - E-cigarette
  - Nicotine patch
  - Varenicline
11. Which of the following NRT products has the fastest onset of action?
- Gum
  - Inhaler
  - Lozenge
  - Oral Spray
  - Patch
12. Which of the following is the most serious side effect of bupropion?
- Anxiety
  - Dry mouth
  - Hypertension
  - Insomnia
  - Seizures
13. When should Varenicline be started in relation to a fixed quit date?
- 1 month before the quit date
  - 1-2 weeks before the quit date
  - 3 days before the quit date
  - On the quit date
14. Which of the following statements about e-cigarettes is true?
- They are approved by Health Canada for smoking cessation
  - They are likely less harmful than regular cigarettes, but not harmless
  - They heat tobacco to a temperature below combustion
  - They do not contain nicotine

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| 1. abcde | 4. abcde | 7. abcde | 10. abcde | 13. abcde |
| 2. abcde | 5. abcd  | 8. abcde | 11. abcde | 14. abcd  |
| 3. abcd  | 6. abcd  | 9. abcde | 12. abcde |           |

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