

# How can we better help cancer patients quit smoking? The London Regional Cancer Program experience with smoking cessation

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## ABSTRACT

**Background** Because continued cigarette smoking after a cancer diagnosis is associated with detrimental outcomes, supporting cancer patients with smoking cessation is imperative. We evaluated the effect of the Smoking Cessation Program at the London Regional Cancer Program (LRCP) over a 2-year period.

**Methods** The Smoking Cessation Program at the LRCP began in March 2014. New patients are screened for tobacco use. Tobacco users are counselled about the benefits of cessation and are offered referral to the program. If a patient accepts, a smoking cessation champion offers additional counselling. Follow-up is provided by interactive voice response (IVR) telephone system. Accrual data were collected monthly from January 2015 to December 2016 and were evaluated.

**Results** During 2015–2016, 10,341 patients were screened for tobacco use, and 18% identified themselves as current or recent tobacco users. In 2015, 84% of tobacco users were offered referral, but only 13% accepted, and 3% enrolled in IVR follow-up. At the LRCP in 2016, 77% of tobacco users were offered referral to the program, but only 9% of smokers accepted, and only 2% enrolled in IVR follow-up.

**Conclusions** The Smoking Cessation Program at the LRCP has had modest success, because multiple factors influence a patient's success with cessation. Limitations of the program include challenges in referral and counselling, limited access to nicotine replacement therapy (NRT), and minimal follow-up. To mitigate some of those challenges, a pilot project was launched in January 2017 in which patients receive free NRT and referral to the local health unit.

**Key Words** Smoking, tobacco, smoking cessation programs

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## INTRODUCTION

Tobacco smoking is known to cause a number of malignancies, and the effects of continued cigarette smoking on patients after a diagnosis of cancer are now clear. Those effects include decreased overall and cancer-specific survival and increased risk of cancer recurrence, treatment toxicity, secondary malignancy, depression, stress, and reduced quality of life<sup>1–4</sup>. However, up to 50% of patients who were smoking before a cancer diagnosis continue to smoke during treatment<sup>3</sup>. For those reasons, smoking cessation interventions should be a part of standard oncologic treatment and could involve individual counselling or hospital- or community-based programs.

A diagnosis of cancer could be a motivating factor that helps patients to quit smoking in conjunction with smoking cessation programs<sup>5</sup>. Conversely, smoking cessation can be particularly challenging for cancer patients because fear of cancer recurrence is associated with relapse, as are anxiety, depression, urge for a cigarette, stress, and medical comorbidities, including chronic obstructive pulmonary disease<sup>3,6</sup>. In addition, it is unclear whether the efficacy of smoking cessation interventions designed for the general population would be similar in a cancer patient population.

When combined, pharmacotherapy and behavioural treatments provide the most durable abstinence rates: approximately 25%–30% for the general population<sup>7</sup>. Available pharmacotherapy in Canada includes nicotine

replacement therapy [NRT (patch, gum, lozenge, inhaler, oral spray)], bupropion, and varenicline. Effective behavioural interventions include practical counselling for problem-solving skills, emotional support, self-help materials, and individual or group counselling sessions (focusing on problem solving, relaxation training, coping, peer support, and so on). All provinces and territories in Canada also offer free telephone counselling and Internet-based support<sup>7</sup>. Health care providers are encouraged to follow the “3As Model” as described by the Ottawa Model for Smoking Cessation: ask about smoking status, advise about the benefits of cessation, and act to refer the patient to a smoking cessation program and then arrange for follow-up<sup>8</sup>.

However, the foregoing smoking cessation initiatives were designed for the general population and might have to be tailored for cancer patients, who could be experiencing unique physical limitations (for example, oral NRT sprays are precluded in patients with mucositis from head-and-neck radiation) and psychosocial stressors as a consequence of their cancer diagnosis and treatment. In 2014, the London Regional Cancer Program (LRCP) in London, Ontario, launched a Smoking Cessation Program for all cancer patients who use tobacco, based on the Ottawa Model for Smoking Cessation<sup>8</sup>. The goal of the present study was to evaluate the success of the Smoking Cessation Program at the LRCP in 2015 and 2016.

## METHODS

The Smoking Cessation Program was introduced at the LRCP in March 2014. When a patient registers at the LRCP before their first consultation, they are asked to complete a brief questionnaire about their smoking status. They are asked if they have used any form of tobacco in the preceding 6 months. If the answer is no, the remaining questions are left uncompleted, and the form is returned. If the patient indicates tobacco use in the preceding 6 months, then that patient is identified as a current or recent user and is asked about tobacco use in the preceding 7 days, the forms of tobacco currently used (cigarettes, cigars, pipes, other), the amount smoked daily or monthly, the number of minutes from waking to first smoke, the importance to them of quitting (scale: 1–5), and the confidence they feel in their ability to quit (scale: 1–5).

Patients who have indicated that they are smokers are counselled by the intake clerk about the benefits of smoking cessation, specifically with respect to the success of their cancer treatment. Smokers are then asked if they would like to be referred to the LRCP Smoking Cessation Program to assist them in a smoking cessation attempt. Those who agree to a referral are provided with a Quit Kit, which contains information from Cancer Care Ontario and the Ottawa Model for Smoking Cessation that outlines the benefits of smoking cessation and the various options available to assist them with smoking cessation. Then, within the following 2 weeks, a smoking cessation champion will contact the patient to provide additional information, counselling, and support, and to offer a referral to the Public Health Unit, if needed, for further counselling and NRT. The smoking cessation champions are employees at

the LRCP, typically a nurse or radiation therapist, with additional training in smoking cessation. A smoking cessation champion is available at all times by pager to meet, on an as-needed basis, with the patient interested in smoking cessation. Referred patients are contacted by the smoking cessation champion either in person or by telephone.

When patients are first screened and accept a referral to the Smoking Cessation Program, they are offered additional follow-up by automated telephone or e-mail contact for 6 months. An automated telephone call is regularly made to the patient to assess the individual’s progress with smoking cessation. A nurse monitors the communication and contacts patients as needed for additional counselling or support.

Monthly from January 2015 to December 2016, referral data were collected and evaluated, including the number of new cancer patients registered at the LRCP, the number of cancer patients screened, the number of patients identified as new or recent tobacco users, the number of smokers advised of the benefits of smoking cessation, the number of smokers who were offered and who accepted a referral to the LRCP Smoking Cessation Program, and the number of smokers who accepted a referral to the interactive voice response (ivr) follow-up system. The study received institutional ethics board approval.

## RESULTS

Data collected in 2015 from the Smoking Cessation Program indicate that, of the 6613 new patients who registered at the LRCP, 5090 (77%) were screened for tobacco use. Of screened patients, 18% identified as current or recent tobacco users. Although 84% of smokers were advised of the benefits of cessation by the intake clerk and offered a referral to the Smoking Cessation Program, only 13% accepted. Of those patients, only 3% enrolled in the ivr follow-up system.

In 2016, 6627 new patients registered at the LRCP, and 5251 (79%) were screened for tobacco use. Again, 18% identified themselves as current or recent tobacco users. Of the smokers, 78% were advised of the benefits of smoking cessation, and 77% were offered a referral to the Smoking Cessation Program. Only 9% of tobacco users accepted referral, and a mere 2% accepted enrolment in the ivr follow-up system.

Combined results (Table 1) demonstrate that between January 2015 and December 2016, 13,240 patients new patients were registered at the LRCP. Of those patients, 10,341 (78%) were screened, and 1866 (18%) identified themselves as current or recent tobacco users. Of those 1866 patients, 1507 smokers (81%) were advised of the benefits of smoking cessation, and 1499 (80%) were offered a referral to the Smoking Cessation Program. Only 211 patients (11%) accepted a referral, and 51 (3%) enrolled in the ivr follow-up system.

## DISCUSSION

The smoking cessation program at the LRCP had modest success during the years 2015–2016. At the LRCP, 18% of cancer patients identified themselves as current or recent tobacco users, which is consistent with national and

**TABLE 1** Data collected from the London Regional Cancer Program (LRCP) Smoking Cessation Program, 2015–2016

Step along the LRCP smoking cessation pathway	Measure	Result
New ambulatory care patients	(n)	13,240
Patients screened for tobacco use	[n (% new pts)]	10,341 (78)
Patients identified as current or recent smokers	[n (% screened)]	1,866 (18)
Smokers advised of cessation benefits	[n (% smokers)]	1,507 (81)
Smokers offered referral to the program	[n (% smokers)]	1,499 (80)
Smokers who accepted referral	[n (% smokers)]	210 (11)
Smokers who enrolled in IVR follow-up system	[n (% smokers)]	51 (3)

Pts = patients; IVR = interactive voice response telephone.

provincial data<sup>9</sup>. Most patients attending the LRCP are screened for tobacco use, and most smokers are counselled and offered a referral to the Smoking Cessation Program; however, very few accept referral (11% of tobacco users in 2015–2016). With limited follow-up, the continued success of those patients remains unknown.

Other smoking cessation programs for cancer patients have been described and evaluated in the literature, using nonpharmacologic and pharmacologic interventions alone or in combination in both the inpatient and outpatient settings. Some studies have shown no significant difference in efficacy between the various programs<sup>10–13</sup>; others show a benefit (compared with control subjects) for patients receiving counselling, cognitive behavioural therapy, and pharmacotherapy<sup>14–16</sup>. Higher-than-expected abstinence rates in the control groups (up to 70% at 1 year) suggest that the limited counselling in the control arms might in itself be beneficial for cancer patients<sup>17</sup>. Although e-cigarettes might decrease cigarette cravings and are being increasingly used by patients as a means to reduce smoking<sup>3</sup>, it has been shown that patients who self-reported e-cigarette use were less likely to have successfully quit smoking<sup>18</sup>. Quitting abruptly (“cold turkey”) is perceived as the most effective cessation method among smokers<sup>18</sup>.

With respect to optimal non-pharmacotherapeutic interventions, a meta-analysis of 946 patients supports the use of smoking cessation counselling to improve smoking cessation rates (pooled risk ratio: 0.76; 95% confidence interval: 0.59 to 0.97)<sup>15</sup>. For example, compared with brief counselling alone, the use of a cognitive behavioural therapy workbook, telephone cognitive behavioural therapy sessions, and pharmacotherapy were shown to benefit smokers with head-and-neck cancer and either depression or alcohol use, achieving quit rates of 47% and 31% respectively at 6 months ( $p < 0.05$ )<sup>16</sup>. Patients with comorbid conditions, including alcohol use and depression, are more successful in their smoking cessation attempt when those other issues are addressed simultaneously<sup>16</sup>. A recent randomized controlled trial showed no benefit for the addition of a computerized reduce-to-quit strategy to counselling and free NRT in newly diagnosed cancer patients before surgery, with abstinence rates being 32% at 6 months in both groups<sup>12</sup>. Most patients prefer to receive

educational material in the form of a pamphlet, although patients 45 years of age and younger prefer education over the telephone<sup>19</sup>.

With respect to optimal pharmacotherapeutic interventions, the addition of bupropion was not shown to provide an additional benefit to cancer patients when combined with counselling and NRT. Compared with cancer patients without depression, those reporting depressive symptoms are less likely to successfully quit smoking, but they are more likely to benefit from the addition of bupropion<sup>13</sup>.

The University of Texas MD Anderson Cancer Center Tobacco Treatment Program includes an in-person consultation, followed by 3 months of pharmacotherapy and 6–10 weeks of counselling. Additional counselling is provided through weekly 30- to 45-minute sessions for 6–10 weeks. Those sessions include problem-solving skills, social support, motivation, and so on, as needed. Pharmacotherapy includes varenicline, bupropion, and NRT as needed. A post hoc analysis of patients enrolled in the Tobacco Treatment Program from 2006 to 2013 demonstrated that patients who were treated with varenicline were more likely to be abstinent at mid-treatment, end of treatment, and 6 months after the end of treatment<sup>14</sup>.

Patient factors proposed to be associated with increased smoking cessation success include higher income; fewer number of pack-years; lack of a history of tobacco or betel nut chewing; use of cigars, a pipe, or marijuana; family doctor visit within the preceding 3 months; a non-smoking spouse; lack of exposure to second-hand smoke; and having fewer friends who smoke<sup>6</sup>. In another study, other patient characteristics postulated to be predictive of smoking cessation success included older age at the time of enrolment in a smoking cessation program, diagnosis of a non-tobacco-related malignancy, diagnosis of stage III or IV cancer, and older age when started smoking<sup>20</sup>. Sex as a predictive factor has been inconsistent in the literature, with some studies reporting female sex<sup>6</sup> and others reporting male sex<sup>20</sup> to be more predictive of success. Patient factors associated with a lower rate of abstinence include history of panic attacks, higher nicotine dependence scores, depression, anxiety, and fear of cancer recurrence<sup>2,6,14</sup>. Predictors of relapse after head-and-neck or thoracic cancer surgery include low desire to quit, low quitting self-efficacy, previous or current depressive symptoms, and fear of cancer recurrence<sup>21</sup>.

Patients who believe that smoking cessation would be challenging might be more likely to enrol in a smoking cessation program<sup>22</sup>. Factors predictive of a cancer patient declining to enrol in a smoking cessation program when offered include diagnosis of head-and-neck cancer, fewer symptoms, and pre-contemplation stage of readiness to quit. Previous number of quit attempts, sex, education, marital status, and age have not been associated with enrolment. The most common reasons given by patients who declined enrolment were that they wished to quit on their own, that they were not interested in quitting, or that they felt the program was too inconvenient<sup>23</sup>. Furthermore, financial incentive has not been shown to be an effective means of increasing enrolment<sup>24</sup>.

Clinicians are also challenged with providing smoking cessation counselling for cancer patients. An international survey of oncologists determined that the rate at which

oncologists inquire about tobacco use is “always” or “most of the time,” but that fewer oncologists advise patients to stop or ask patients if they would consider cessation. And despite the fact that more than 90% of respondents indicated that they “strongly agree” or “agree” that smoking affects cancer outcomes and that tobacco cessation should be part of standard cancer treatment, only a small proportion of oncologists report discussing pharmacotherapy for smoking cessation or actively referring patients to smoking cessation programs. The most commonly identified barrier was the need for more training in tobacco assessment and cessation interventions. Other identified clinician barriers include perceived patient resistance to treatment, belief that intervention would be ineffective, lack of available resources or referrals for intervention, and lack of available time<sup>25</sup>.

The 5As approach to smoking cessation counselling (Ask, Advise, Assess, Assist, Arrange) by gauging the patient’s readiness to quit, has now fallen out of favour<sup>8</sup>. Formally assessing a patient’s readiness to quit based on the transtheoretical model of change (pre-contemplation, contemplation, preparation, action, and maintenance) is no longer recommended. Even though patients in the pre-contemplation stage might want to quit, it has been demonstrated that they can feel discouraged by previous failed attempts or are unaware of the detrimental effects of smoking. Additionally, patients cycle through those various stages, and an instantaneous assessment of a patient’s state of mind might not accurately reflect the patient’s overall willingness to make a quit attempt<sup>26</sup>. It has also been shown in trials that smokers who report that they are not ready to quit actually quit at the same rate as those who indicate that they are ready. Factors other than a patient’s readiness to quit might be influencing attempts and success at smoking cessation<sup>27</sup>. In response to those developments, Cancer Care Ontario promotes the streamlined 3As Model<sup>28</sup>: Ask cancer patients about their tobacco use. Advise patients about the benefits of quitting. Act to refer the patient to a smoking cessation program.

Several strategies have been proposed to improve the success of smoking cessation programs for cancer patients. One example meant to increase the uptake of cancer patients into smoking cessation programs is to include cessation interventions into lung cancer screening programs such that, compared with low-dose computed tomography screening alone, the reduction in lung cancer mortality is improved<sup>29</sup>. The Lung Cancer Screening Pilot for People at High Risk implemented by Cancer Care Ontario in 2017 includes a smoking cessation component<sup>30</sup>. Another strategy is to implement a smoking cessation program at the time of lung cancer surgery, which has been demonstrated to be cost-effective in modelling studies<sup>31</sup>.

A paradigm that could work well for oncology patients is the “opt-out” model, in which, rather than asking patients if they are ready to quit and only then offering counselling and pharmacotherapy to those who indicate an interest, health care providers provide the same counselling and pharmacotherapy to all tobacco users<sup>27</sup>. Given that all cancer centres in Ontario have a Smoking Cessation Program and that telephone counselling is available to all smokers across Canada, a simple and effective way to increase referrals for smoking cessation interventions is to provide

those interventions to all smokers by default rather than to ask them if they would like to be referred. Patients would be able to decline; however, the goal is for more patients to accept the intervention as part of routine cancer care.

In light of the modest success of the Smoking Cessation Program at the LRCP, with only 11% of smokers accepting a referral in 2015–2016, changes are being made to optimize the smoking cessation program locally. Identified limitations of the current program include challenges in referring and counselling patients, limited access to NRT, and minimal follow-up. To help mitigate some of those challenges, a pilot project was initiated in January 2017 in which patients are provided with a free 4-week NRT supply in the form of patches and a short-acting formulation in parallel with a referral to their local Public Health Unit for ongoing follow-up, support, and further NRT. After patients are screened and counselled, they are informed that a referral to the Smoking Cessation Program now includes a free 4-week supply of NRT and extended follow-up. The NRT patch is prescribed according to the patient’s tobacco use (based on the cigarettes smoked per day and the time between waking and first cigarette). Short-acting NRT is tailored to the patient’s preference, and all patients are seen by the hospital pharmacist for additional counselling and instruction. In June 2017, the intake clerks offering referrals to the program were encouraged to begin using the “opt-out” model<sup>27</sup> and, rather than ask if patients are interested in a referral, to refer all patients to the program, with the patient able to decline. Because of positive qualitative feedback received from providers and patients alike, funding for the NRT was extended to at least 31 March 2018. We are currently in the process of reaching out to patients who participated in the NRT program to gather information about the success of the initiative and, specifically, about how many cigarettes they continue to smoke, if any. Results from the pilot project will be the subject of a subsequent analysis. In the future, our Smoking Cessation Program could be optimized further by providing additional training to the intake clerks who offer patients referral to the program or by initially involving a smoking cessation professional with the aim of increasing patient enrolment.

## CONCLUSIONS

The Smoking Cessation Program at the LRCP has had modest success. Most patients are being screened, counselled, and offered referral to the program; however, only a very small proportion are accepting referral. Identified limitations of the current program include challenges in referring and counselling patients, limited access to NRT, and minimal follow-up.

Cancer patients who continue to smoke at the time of a cancer diagnosis constitute a unique patient population. They are motivated to quit smoking and have good reason to quit to improve their outcomes, including less toxicity and greater efficacy of treatment. Furthermore, most oncologists recognize that smoking cessation is an important aspect of cancer care. However, many factors act as barriers to the success of cancer patients in their cessation attempt. Patient, provider, and system factors have been identified and can be modified to improve smoking cessation interventions for cancer patients.

A new pilot project was implemented in January 2017 to improve the LRCP Smoking Cessation Program. Patients accepting referral to the program are now provided with a free 4-week supply of NRT and a referral to the local Public Health Unit for continued support. Results of that project will be reported in the future.

#### CONFLICT OF INTEREST DISCLOSURES

We have read and understood *Current Oncology's* policy on disclosing conflicts of interest, and we declare the following interests: AVL has received honoraria from Varian Medical Systems Inc. The remaining authors have no conflicts to disclose.

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