

E-Cigarettes and Cancer Patients

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The increasing popularity and availability of electronic cigarettes (i.e., e-cigarettes) in many countries have promoted debate among health professionals as to what to recommend to their patients who might be struggling to stop smoking or asking about e-cigarettes. In the absence of evidence-based guidelines for using e-cigarettes for smoking cessation, some health professionals have urged caution about recommending them due to the limited evidence of their safety and efficacy, while others have argued that e-cigarettes are obviously a better alternative to continued cigarette smoking and should be encouraged. The leadership of the International Association for the Study of Lung Cancer asked the Tobacco Control and Smoking Cessation Committee to formulate a statement on the use of e-cigarettes by cancer patients to help guide clinical practice. Below is this statement, which we will update periodically as new evidence becomes available.

Key Words: Electronic cigarette, Smoking cessation, Lung cancer.

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Tobacco consumption is the second leading cause of death in the world today, currently responsible for more than 5 million deaths each year with many of these deaths occurring prematurely.^{1,2} Although there exists a wide diversity in the tobacco products available to consumers, ranging from cigars, pipes, and cigarettes to noncombustible forms of tobacco such as chewing tobacco and moist snuff, manufactured cigarettes are by far the most common type of tobacco product consumed and also the most dangerous.³ Both combustible and noncombustible tobacco products pose health risks to the user, but cigarettes and combustible tobacco products are particularly dangerous with more than 6000 known chemical constituents and 60 known carcinogens and inherent design features that allow for deep inhalation of smoke and nicotine

into the lungs.⁴ As a result, most people develop a strong long-lasting addiction to cigarettes, which makes it hard to avoid the repeated exposures to harmful smoke toxins.⁵

The adverse effects of smoking continue after a cancer diagnosis. Continued smoking increases the risk for treatment-related complications, recurrence, the development of a second primary cancer, and mortality from both cancer-related and non-cancer-related causes.^{4,6–11} The adverse effects of smoking are noted across cancer disease sites and affect treatment outcomes for surgery, chemotherapy, radiotherapy, and targeted therapy such as biological therapies. Several studies have demonstrated that smoking cessation at or following a cancer diagnosis can reverse the adverse effects of tobacco on cancer treatment outcomes.^{12–15}

Obviously, the best preventative measure to curb the adverse health effects associated with smoking is abstaining from smoking or tobacco cessation. Treatment-related guidelines are available to provide a foundation upon which to base smoking cessation intervention. However, the reality of helping patients overcome their nicotine dependence is not as simple as telling someone to quit and offering a prescription for a stop smoking medication.¹⁶

Most cancer patients who persist in smoking already recognize the adverse health effects and the importance of stopping smoking. The vast majority of patients will report that they want to quit and have tried to stop previously, with many having used a range of methods from cold turkey to various forms of pharmacotherapy and behavioral support.^{17–19} Because of the treatment-related consequences of continued smoking, there is urgency for most cancer patients to stop smoking immediately, yet tobacco cessation studies have often ignored cancer patients.^{20–22} Most cancer patients expect to be asked about their tobacco use when seen by their doctor and are generally receptive to the offer of cessation support.²³ Some patients are embarrassed by their smoking and will sometimes misrepresent their tobacco use, so biochemical markers such as cotinine and/or carbon monoxide can be used to help ensure more accurate assessment of current tobacco use.²⁴ Although most oncologists seem to ask about tobacco use and advise patients to stop smoking, most do not regularly provide cessation assistance.^{21,22} However, assessing and assisting patients who use tobacco should be standard of care for all cancer patients.^{16,25} That said, clinicians are now faced with a new dilemma—what do we tell our patients about e-cigarettes? What are e-cigarettes? Can e-cigarettes help

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someone stop smoking? Are e-cigarettes less harmful than cigarettes?

WHAT ARE E-CIGARETTES?

Electronic cigarettes (i.e., e-cigarettes) are battery-powered devices that deliver nicotine in an aerosol to the user.²⁶⁻³⁹ The first electronic cigarette was created in 1963 when an American engineer named Herbert A. Gilbert filed a patent for a device that produced a nicotine-containing steam.⁴⁰ However, this device was never commercialized. The modern electronic cigarette was invented in 2003 by a Chinese pharmacist named Hon Lik for his father who was a heavy smoker with lung cancer.⁴¹ E-cigarettes were sold first in China in 2004 and later exported by the Ruyan company and made available over the Internet and more recently in retail establishments in Europe and in the United States. E-cigarettes heat and vaporize a solution containing nicotine, and many are designed to look outwardly like traditional tobacco cigarettes (Figure 1). Thus, as a cigarette-like device that mimics both hand-to-mouth and oral-sensory experiences of a traditional cigarette, e-cigarettes have the potential to attract significant numbers of customers who might otherwise smoke cigarettes.

CAN E-CIGARETTES HELP SOMEONE STOP SMOKING?

There are no clinical guidelines that recommend the use of e-cigarettes for smoking cessation. Electronic cigarettes have not been approved as a stop smoking treatment by the U.S. Food and Drug Administration or any other government agency responsible for evaluating the safety and efficacy of drugs for smoking cessation. Australia and Canada have banned the retail sale of e-cigarettes. Other countries, such as the United Kingdom, are considering regulating e-cigarettes like medicinal nicotine products. Although many smokers report using e-cigarettes to reduce or help them stop smoking, there is a paucity of reliable data on their efficacy for smoking cessation.³³⁻³⁹ Although a recent study found that e-cigarettes with or without nicotine were about as effective as a nicotine patch in helping smokers abstain from using tobacco cigarettes,³⁹ there are no published studies evaluating the safety and efficacy of e-cigarettes for smoking cessation in patients with chronic obstructive pulmonary disease (COPD) or cancer.

ARE E-CIGARETTES LESS HARMFUL THAN CIGARETTES?

E-cigarettes deliver heated nicotine aerosol with a few other chemicals, so compared with smoking cigarettes there is exposure to many fewer inhaled chemicals.³¹ For patients with a serious lung ailment, it is reasonable to be cautious about recommending the use of any treatment that involves

inhaling foreign material into the airways. It is likely to be many years before the harms (if any) associated with the acute and long-term exposure to e-cigarettes can be more completely ascertained.

WHAT DO I TELL MY PATIENTS?

First, tell your patients to stop smoking cigarettes immediately. There needs to be an urgency to get cancer patients to stop smoking because the adverse effects of continued smoking can be immediate and severe.⁶⁻¹¹ Second, tell your patients that you are willing to work with them to overcome their nicotine dependence. The treatment guidelines for tobacco dependence are a good starting point to identify evidence-based options for smoking cessation,¹⁶ although you can acknowledge that current treatment approaches for nicotine dependence are only minimally effective.⁴² Third, explain to your patient that the safety and effectiveness of e-cigarettes are not fully understood, nor is there any evidence to suggest that e-cigarettes are safer or more effective than existing government-approved stopping smoking medications. Table 1 provides some clinical scenarios and suggestions on when e-cigarettes might or might not be considered as an adjunct to established nicotine dependence treatments.

In summary, cancer patients deserve treatment guidance from their doctor. Those who smoke should be advised to stop smoking and informed of the evidence-based treatment methods that have been shown to increase cessation outcomes compared to unassisted quitting. Most smokers believe that they ought to be able to quit on their own without assistance and are skeptical about the value of current treatment approaches for nicotine dependence.⁴³ However, given the importance of smoking cessation for cancer patients, oncologists should be insistent in their efforts to assist their patients to stop smoking including considering combination therapies.^{25,44}

There are currently no evidence-based guidelines to support the recommendation of e-cigarettes. Whereas evidence-based cessation strategies should be used wherever possible, clinicians should consider the strong need for cancer patients to stop smoking as soon as possible to promote the most effective outcomes of cancer therapy. In the absence of sufficient evidence that e-cigarettes are effective and safe for treating nicotine dependence in cancer patients, the International Association for the Study of Lung Cancer advises against recommending their use at this time. However, this recommendation may change if new data become available. The International Association for the Study of Lung Cancer does recommend that research be done to evaluate the safety and efficacy of e-cigarettes as a cessation treatment in cancer patients to help guide clinical practice. For individual patients who are either using or planning to use e-cigarettes despite advice not to do so, they should be offered

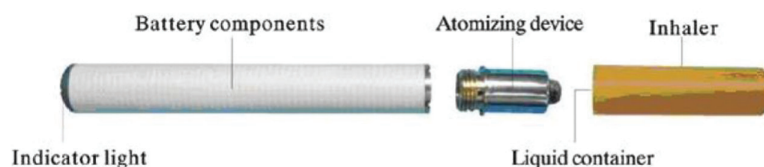


FIGURE 1. Schematic of an e-cigarette. Source: <http://www.electroniccigarette.com/faq/>.

TABLE 1. Clinical Scenarios and Suggested Responses for Patients

Clinical Scenarios	Suggested Response	Comment
The patient has recently stopped smoking, using methods other than e-cigarettes	The patient should be congratulated on having stopped smoking cigarettes and monitored for relapse to smoking. If the patient is using pharmacotherapy, it is worthwhile to discuss how long the patient feels a need to use the medications and discuss options to wean off medication support	The patient should be told to avoid using any form of tobacco including e-cigarettes since this might trigger relapse back to smoking. Some patients do benefit from the use of stop smoking medications beyond 8–12 wk, so continued use can be justified if the patient feels there is a benefit to helping them refrain from smoking cigarettes. In patients who are still undergoing or recovering from intensive cancer treatment, continuing pharmacotherapy—if they have achieved smoking cessation—may be reasonable rather than introducing the fear of smoking relapse at a critical time for the patient
The patient has recently stopped smoking but reports using an e-cigarette to refrain from smoking	The patient should be congratulated on having stopped smoking cigarettes and monitored for relapse to smoking. It is worthwhile to discuss how long the patient feels a need to use the e-cigarette and discuss options to wean off e-cigarettes, including consideration of switching to cessation pharmacotherapy rather than using an e-cigarette	The patient should be encouraged to wean themselves off e-cigarettes. Clinicians should continue to offer adjunctive smoking cessation support while monitoring for any adverse effect of e-cigarette use
The patient is still smoking but is interested in stopping	The patient should be congratulated on being willing to give up smoking cigarettes and offered behavioral counseling and/or pharmacotherapy as appropriate following recommended treatment guidelines for nicotine dependence. E-cigarettes should not be recommended as a cessation therapy	If the question of e-cigarettes is raised, the patient should be advised that e-cigarettes have not been established to be an effective treatment for stop smoking. A preference for established treatments should be clear. Clinicians should continue to offer adjunctive smoking cessation support while monitoring for any adverse effect of e-cigarette use. If e-cigarette use does not eliminate smoking, it should be discontinued
The patient continues to smoke and is not interested in stopping	The patient should be encouraged to stop smoking cigarettes, using evidence-based methods at every opportunity. Repeated assessments, advice, and providing access to nicotine medications even for patients not ready to quit has been found to increase quit attempts and cessation	There is no evidence to support e-cigarette use in this scenario. Research is needed in this area to define the actual benefits and harm associated with dual use of e-cigarettes and smoking

evidence-based stop smoking treatments while monitoring for any adverse effect of e-cigarette use.

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