

E-cigarettes: Understanding the Potential Risks & Benefits

Why the Big Controversy?

Electronic cigarettes (e-cigarettes) are cylindrical devices made of stainless steel or plastic that mimic cigarettes in terms of their appearance, use, and sometimes taste, but with a critical difference—they do not contain tobacco. They are designed to deliver nicotine without subjecting the user to the toxic chemicals in tobacco and tobacco smoke.

A typical e-cigarette consists of a battery, an atomizer that heats the liquid and turns it into a vapour,

and a cartridge that contains flavouring and (sometimes) nicotine in a base of propylene glycol (PG) or vegetable glycerin (VG) and water.

Proponents believe that e-cigarettes represent a clean drug delivery device that can



satisfy smokers' addiction to both nicotine and smoking behaviours and thus greatly reduce their health risks.

Because there is no combus-

tion and no tobacco, e-cigarettes are almost certainly much less harmful than cigarettes.

Opponents believe that the sale of e-cigarettes with nicotine should only be permitted after they have undergone clinical trials to prove their safety and their efficacy in helping smokers quit. As well, many fear that the

widespread promotion and use of e-cigarettes, both with and without nicotine, will undermine successful efforts to reduce tobacco use.

Are they legal?

E-cigarettes with nicotine **cannot** legally be imported, marketed, or sold in Canada. (They must first be approved as a new drug by Health Canada.)

E-cigarettes that make a health claim—such as they can help you quit smoking—**cannot** legally be sold in Canada.

E-cigarettes with no nicotine and no health claim **can** legally be imported, marketed, and sold.

What Are the Health & Safety Risks?

With no tobacco and no combustion, e-cigarettes are almost certainly much safer than cigarettes, and to date there has been little real-world evidence of harm from their use. It is premature, however, to conclude that e-cigarettes are *safe* to use, in part because no long-term studies have been conducted. As well, most studies involve very small sample sizes and the study designs lack scientific rigour.

While propylene glycol is considered safe for *oral* consumption, the health risks of *inhaling* PG and other chemicals into the lungs many times a day

over months or years are not known. Tobacco-specific nitrosamines and heavy metals have been found in e-liquid and vapour, but in some cases the levels have been comparable to those found in nicotine replacement therapies (NRTs).

The most common side effects from e-cigarette use are sore throat, dry cough, and headache due to inhalation of PG/VG and/or nicotine. These effects, however, often diminish substantially after several months of use and are also found with the nicotine inhaler and gum. Several substances have been detected in the second-hand vapour from e-cigar-

ettes, including nicotine, PG, flavourings, and traces of heavy metals. The health risks of second-hand vapour, while much lower than those of second-hand tobacco smoke, likewise need to be assessed.

For many, a major concern is that e-cigarettes could perpetuate nicotine addiction in smokers or lead to nicotine addiction among youth.

Another concern is that e-cigarette devices and e-liquid/cartridges are not manufactured to approved consumer safety standards in approved facilities.

Who is using e-cigarettes?

- 40% of current and former smokers age 18+ in Canada are aware of e-cigarettes, and 4% have tried them.
- 16% of young adults age 16-30 in Canada have tried an e-cigarette, including 35% of smokers and 5% of non-smokers. Rates of current use are much lower—15% of smokers and less than 1% of non-smokers.
- Ever use among US high school students doubled from 4.7% to 10.0% from 2011 to 2012; rates of current e-cigarette use (past 30 days) increased from 1.5% to 2.8%.

Recommended Regulation

E-cigarettes should be subject to the same restrictions as tobacco products. This would help ensure that e-cigarettes do not undermine progress in reducing tobacco use.

Federal and provincial/territorial governments should take the following actions:

- Ban the sale of e-cigarettes to minors.
- Ban the use of e-cigarettes wherever smoking is banned.
- Ban the sale of flavours that appeal to children.
- Ban the retail display of e-cigarettes.
- Prohibit the promotion of e-cigarettes in print, on TV, on radio.
- Prohibit lifestyle advertising.
- Ban the sale of e-cigarettes wherever tobacco sales are banned.

Will E-cigarettes Undermine Progress in Reducing Smoking?

Many health groups fear that e-cigarettes will undermine hard-won gains in tobacco control, including workplace and public place smoking bans. Health units across Ontario (and elsewhere) have reported a growing number of incidents in which the alleged use of an e-cigarette served to complicate enforcement of the *Smoke-Free Ontario Act*:

The use of e-cigarettes in places where smoking is not permitted increases social exposure to smoking and may contribute to the 'renormalization' of smoking behaviours, important factors in youth uptake. Public use of e-cigarettes also provides visual cues to smoke, which undermines

quit attempts and promotes relapse. As well, e-cigarettes are being promoted in all the same ways that cigarettes were before most tobacco marketing was banned, giving rise to fears that these promotions may serve to make smoking once again appear to be normative and desirable behaviour. Attractive young women (and sometimes men) exuding sex appeal are often featured in e-cigarette ads, and celebrity endorsements are a common form of promotion. E-cigarette companies have likewise begun spon-

soring popular events such as car racing, long a favourite sponsorship activity of Big Tobacco.



E-cigarettes could also undermine tobacco control if e-cigarettes become a gateway to smoking for youth or if they promote dual use among smokers and thereby undermine smoking cessation.

Can E-cigarettes Help Smokers Quit Smoking?

There is no definitive evidence that e-cigarettes are effective in helping people quit smoking—most studies to date have been small and unscientific. However, the research has yielded some promising results.

A small randomized controlled trial (RCT) found that e-cigarettes with nicotine are as effective as the patch in helping smokers quit, achieving rates of six-month continuous abstinence of 7.3% and 5.8%, respectively.

Several studies have found that e-cigarettes are effective in helping smokers reduce their cigarette con-

sumption. The RCT found that e-cigarettes both with and without nicotine are more effective than the patch in reducing daily consumption among smokers; 57% who used e-cigarettes with nicotine reduced by half or more the number of cigarettes they smoked per day, versus 41% of patch users. A large survey of 6,000 current and former smokers from the US, UK, Canada, and Australia found that e-cigarette users were considerably more likely than non-users to reduce their cigarette consumption but not more likely to quit smoking.

Various studies cite the inconsistent nicotine dosing from e-cigarettes or the low levels of plasma nicotine achieved by e-cigarette use as evidence that they are not an effective cessation aid. However, other studies have found that e-cigarettes (a) can be effective in reducing cravings regardless of whether they contain nicotine and (b) can deliver relatively high levels of nicotine (higher levels delivered faster than NRTs, although not as high as with cigarettes), especially in experienced users, many of whom have experimented to find a combination of device and liquid that works for them.

What's the Role of Big Tobacco?

Another major concern of the health community is the recent entry of major tobacco companies into the e-cigarette market. The obvious motivation of Big Tobacco in buying e-cigarette firms and developing their own electronic products is to maximize profits. But their longer-term strategic goal is unknown:

- Do they see e-cigarettes as a gateway product to cigarette smoking by youth and a means of promoting dual use (and

thus reducing quitting) among current smokers?

- Or do tobacco companies see e-cigarettes as their future, given the increasingly restrictive regulatory environment worldwide for tobacco products, especially

cigarettes, and the consequent decline in smoking rates?

It is impossible to predict the impact of Big Tobacco bringing their immense resources, marketing might, and lobbying prowess to the e-cigarette market, in addition to their practice of pushing the boundaries of both ethical and legal behaviour. One thing is certain, however: the involvement of Big Tobacco means that the stakes are high and that e-cigarettes are not a passing fad.



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