



E-cigarettes in Canada

Governments need to regulate e-cigarettes to protect Canadians against possible harms and to commission further research to better understand usage trends, product safety and determine potential cessation benefits.

Problem:

Electronic nicotine delivery systems, e-cigarettes, vapes or electronic cigarettes are a relatively new product category, which first emerged in 2004. E-cigarettes have been growing in use and are a source of great debate among public health advocates and in the media. As with most unregulated novel products, Canadians are interested in knowing more about the associated implications, including the potential health consequences and benefits. The Heart and Stroke Foundation believes that Canadians deserve accurate information to make knowledgeable decisions, and government policies to protect them against possible harms and to maximize any potential benefits related to e-cigarette use in Canada.

Facts

- E-cigarettes are battery-operated vaping devices that mimic the smoking experience using an inhalation and heating process that vapourizes an internal fluid. The liquid solution varies in composition but is usually propylene or vegetable glycol based and can be combined with other ingredients and flavours.
- E-cigarettes are available with or without nicotine. Although e-cigarettes containing nicotine are not currently legally manufactured, sold or imported in Canada, they are readily available.

- While early studies demonstrated some potential benefits to e-cigarettes as a smoking cessation device, current research remains inconclusive and the body of evidence is rapidly evolving.^{1,2}
- Safety concerns have arisen with these unregulated products, given that the long-term health impact of inhaling propylene or vegetable glycol and the effects of second-hand exposure are unknown.
- Unregulated products also allow e-cigarette manufacturers to set their own manufacturing, marketing and labelling standards. This practice has resulted in inconsistency of standards among different products, as well as an increase in out-of-home, in-store and social media advertising.^{3,4}
- Reports of child poisoning due to accidental exposure and consumption of e-liquids are on the rise, and are concerning to public health experts.⁵ There are also some cases of e-cigarette users being burnt by exploding devices.
- Evidence shows that nicotine use in youth and adolescents particularly can damage the developing brain.^{6,7}
- Researchers and public health experts are concerned there is potential for e-cigarettes to be a gateway to tobacco use and nicotine addiction.⁸
- Marketing and promotion of e-cigarettes is common. Youth are targeted with the addition of attractive candy or fruit flavours. The e-cigarette industry has also expanded marketing tactics to promote lifestyle use, partly by framing it as a method for individuals to exercise their liberty to “vape” where and when they choose.
- Public health experts are concerned about emerging research showing that e-cigarettes could renormalize and undermine tobacco control and smoking cessation efforts.⁸
- E-cigarettes are appealing to youth. A Canadian study found that 18% of high school student non-tobacco smokers had tried e-cigarettes, and another 31% are interested in trying them.⁹ Studies also show that more teens are using e-cigarettes as they see them as “cool” or “fun”.¹⁰
- Various Canadian and international jurisdictions are addressing e-cigarette use in public places in order to maintain progress in tobacco control and also to supplement clean air initiatives.

Background:

Overview

E-cigarettes are battery-operated devices which mimic the smoking experience using an inhalation process that vaporizes an internal fluid. This is sometimes referred to as “vaping.” These non-combustible products most often do not include tobacco. The contained liquid solution varies in composition but is usually propylene or vegetable glycol based and can be combined with other ingredients and flavours.

Legal status in Canada

E-cigarettes are available with or without nicotine. However, e-cigarettes containing nicotine cannot be legally manufactured, sold or imported in Canada. E-cigarette products sold in Canada are also not legally permitted to make any health claims. Canada’s Food and Drugs Act requires that product approval be granted by Health Canada for all products containing nicotine available for use in Canada or any product that makes health claims, and at present, no company has received product approval. However, e-cigarettes containing nicotine and liquid nicotine in e-liquid (or e-juice as it is commonly called) are often available online or in retail outlets in Canada.¹¹

Safety requirements and health risks

No formal safety requirements exist regarding e-cigarette product development, ingredient disclosure, information on nicotine levels and thresholds, and risk of use in Canada. Furthermore, the concentrations of nicotine levels vary in different e-liquids.¹² In some instances, testing has shown that e-cigarette products labelled as nicotine-free do in fact contain nicotine.¹³ As e-cigarettes are a relatively new product, there is a lack of research on the long-term health impacts of inhaling propylene glycol or other ingredients in e-cigarettes as well as the health consequences from second-hand exposure. Knowledge about the long-term effects of e-cigarette nicotine addiction is also limited; however, nicotine is classified as a poison.

There is sufficient evidence to indicate that long-term use of e-cigarettes is likely to pose some direct health risks to users, although level of risk is not currently known.¹⁴ However, the risks from e-cigarettes are likely lower than the risks of smoking combustible tobacco. As a harm





reduction approach, some believe that e-cigarettes are a safer alternative to traditional tobacco cigarettes given that users satisfy their craving and addiction for nicotine without the dangerous effects of combustible tobacco.

Experts agree that complete tobacco cessation over the long term, rather than reducing the number of cigarettes smoked per day, is the most effective way to reduce risk for disease and premature death.¹⁵ Recently, some health organizations endorsed the statement that “e-cigarettes are 95 per cent safer than cigarettes.” This statement is not substantiated by critically appraised evidence, and the authors of the study claimed conflicts of interest due to previous partnerships with e-cigarette industry distributors.¹⁶ ¹⁷ Furthermore, this “95%” calculation is based on the subjective opinions of a select group of individuals; hence the study design is biased. There needs to be more ongoing research into the health effects of e-cigarettes when compared to smoking combustible tobacco products.

E-cigarettes as a potential cessation aid

There is sufficient evidence to support that nicotine replacement therapy (NRT) through skin and mouth (the patch and gum) is effective to aid smokers in quitting. NRT through vapour may be more effective as the nicotine delivery is more efficient than the patch or gum, and it simulates the smoking experience.¹⁸ Early research studies have demonstrated that many smokers are using e-cigarettes as a way to stop smoking, and smokers have

cited e-cigarettes as a useful cessation device; however the effectiveness as a cessation tool at the population level is still unknown.

Research is divided on whether e-cigarettes can be considered a useful smoking cessation device. This lack of consensus is, in part, due to rapidly evolving e-cigarette technology and a lack of standardization in the e-cigarette products studied, which makes it challenging to compare results across studies.

While some research shows e-cigarettes to be useful in quit attempts, other research shows that smokers are unsatisfied with the new devices and return to smoking tobacco cigarettes or maintain dual use of e-cigarettes and conventional cigarettes.¹⁹ A recent review of studies found that e-cigarettes may lower the odds of an individual quitting smoking combustible tobacco products by 28 per cent.²⁰

Dual usage

Dual use of combustible tobacco and e-cigarettes is a topic of concern in Canada, as it is the most common pattern of e-cigarette use among smokers.²¹ Smokers also use e-cigarettes for different reasons.²² While some use e-cigarettes to quit, others use it in lieu of smoking

cigarettes in smoke-free areas, which may have the effect of sustaining their smoking behaviours.

Sales and marketing of e-cigarettes

In Canada, it is illegal to make a health claim regarding an e-cigarette product's ability to aid in smoking cessation or to suggest that it is a safer alternative to smoking traditional tobacco cigarettes. However, lifestyle marketing is common on the internet and social media, and often depicts cheerful and glamorous smokers taking back their right to smoke in public — representing e-cigarettes as a socially acceptable product free of stigmatization and guilt. This positioning is concerning because e-cigarettes are being marketed in a way that could undermine the hard-fought change in social norms related to tobacco use, thus undermining progress in tobacco control. Celebrity e-cigarette endorsements are common and celebrities are often shown using e-cigarettes in entertainment programs, which act as a form of indirect endorsements. Increasing globalization and the growth of digital media mean that Canadians can be exposed to e-cigarette marketing from countries where regulations are absent or less comprehensive.

Sales of e-cigarettes are growing rapidly in Canada and across the globe.^{23,24} Worldwide sales for e-cigarettes reached \$6 billion in 2014, with over a thousand e-liquid flavours available and more than 460 brands in the marketplace.²⁵ This has prompted an increasing number of tobacco manufacturers to purchase e-cigarette companies or to develop their own e-cigarette brands. Precise usage is difficult to determine because population health monitoring tools have only recently begun to include e-cigarette use.

Youth and e-cigarettes

Studies looking at advertising effects on youth found that youth exposed to e-cigarette advertisements are more likely to try e-cigarettes, particularly when flavours are available.^{26,27} Marketing and promotion also target youth through the addition of attractive flavours like Hawaiian punch, bubble-gum and chocolate, as well as colourful design and packaging techniques.

Various studies have shown that users come from a variety of groups including children and youth, current-smokers as well as non-smokers. In an international study, it was estimated that 3 per cent of Canadian adults were current users and 8 per cent had tried e-cigarettes.²⁸ Experimentation of e-cigarettes among youth is alarmingly high. A Canadian investigation into e-cigarette use among youth and young adults found that 16 per cent of young adults had used e-cigarettes in the past and 6 per cent were current users.²⁹ A

similar study found that 18 per cent of Quebec non-tobacco smoking high school students had tried e-cigarettes and another 31 per cent were interested in trying them.⁷ An Ontario study reported 22 per cent of youth in grades 7-12 surveyed tried e-cigarettes in 2015.²⁸ Similar results have been found in US studies, indicating that non-tobacco users are experimenting with e-cigarettes.

Concerns around renormalization

E-cigarettes also have the potential to increase tobacco smoking by expanding the nicotine market among younger people and renormalizing smoking. There is concern that those who do not smoke tobacco cigarettes, but have started to smoke e-cigarettes with nicotine, could potentially form a lifelong addiction to nicotine. Here, e-cigarettes could serve as a gateway for nicotine addiction and tobacco use. Studies conducted in the US have suggested that e-cigarette use in youth is associated with youth and adolescents taking up smoking combustible tobacco products in later years.³¹ ^{32,33} Former smokers who use e-cigarettes might become accustomed to the nicotine intake and habit of smoking and return to smoking traditional tobacco cigarettes in the future.

In summary:

While many in the public health community recognize the potential cessation and harm-reduction benefits of e-cigarettes, there are many unknowns about the product's long term safety and gateway potential for a new generation of tobacco and nicotine users. There is also growing fear that e-cigarettes could renormalize smoking, and those with nicotine could promote dual usage and perpetuate nicotine addiction instead of encouraging full cessation, thus undermining tobacco control efforts. E-cigarette use in public places has the potential to renormalize smoking and serve as a type of marketing and promotion for the products. In light of the need to maintain tobacco control efforts and given the many unknowns around e-cigarette use, there has been growing demand for regulation in Canada and internationally. Municipal, regional and national governments around the world have proposed and implemented policies to regulate e-cigarettes with or without nicotine in a similar fashion as tobacco products. Policies introduced include:

- Complete bans: Brazil, Panama, Australia, Karnataka (India), and Israel among others
- Public space bans: Vancouver BC, Red Deer AB,



Hantsport NS, Innisfil ON, Toronto ON, Calgary, AB, Saskatoon, SK, New Jersey, North Dakota, Utah, Boston, Chicago, Indianapolis, Los Angeles, Nova Scotia and New York among others

- Age purchasing restrictions: California, Hawaii, Idaho, New Jersey, New York, Tennessee, Utah, France, Netherlands, Newfoundland and Labrador, Nova Scotia, New Brunswick, British Columbia, Quebec, and the UK among many others
- Treatment of e-cigarette products as tobacco products: California, Vermont, Nova Scotia, Newfoundland and Labrador, British Columbia, and Quebec among others
- Marketing and promotional restrictions: Quebec among others.

Canadian Solutions:

The Heart and Stroke Foundation recommends that federal, provincial and municipal governments immediately adopt the following policies, for all e-cigarettes where jurisdictionally appropriate:

- **Prohibit use of e-cigarettes in public spaces** and workplaces where smoking is banned by law.
- **Prohibit e-cigarette sales in locations where tobacco sales are banned.**
- **Prohibit e-cigarette sales to minors** (18 or 19 years of age, depending on the minimum tobacco age in the province) as well as banning use of e-cigarettes on elementary and secondary school property.
- **Prohibit the sale of e-liquid flavours that are attractive to youth and adolescents**, such as bubble gum, and candy flavoured e-liquids.
- **Prohibit colourful and deceptive packaging** of e-cigarettes and flavoured e-liquids.
- **Strictly regulate e-cigarette advertising and promotion**, including prohibiting celebrity and lifestyle marketing, unsubstantiated health claims, retail promotion (such as front-counter displays, flyers or brochures, product displays in retail outlets), youth targeted marketing and the co-branding of e-cigarettes with conventional cigarette brands.
- **Regulate the product** to minimize toxic additives in e-liquids, restrict flavours attractive to youth, and require that e-cigarettes be visually distinct from regular cigarettes. The latter is important in order to prevent renormalization and confusion with tobacco cigarettes among youth. In particular, e-cigarettes should not include filters, glowing tips or be the same colour/

shape/dimensions as a traditional tobacco cigarette. Establishing design standards for the e-cigarette and its constituents is also important to minimize risks among users. **Should Health Canada approve the use of e-cigarettes with nicotine, it should then have a regulatory framework where** approval of products should be on a case by case basis with regulations for product standardization, and development of labelling requirements.

- **Dedicate research funding** to enable a deeper understanding of the usage and potential benefits of e-cigarettes as a cessation device as well as their possible risks, including safety, gateway to addiction potential and renormalization. Include e-cigarette surveillance in national survey data collection and monitoring.

Conclusion:

Taking into account the potential threat of :

- **renormalization**, use of e-cigarettes in public places need to be prohibited.
- **gateway to addiction**, e-cigarette sales in locations where tobacco sales are banned should be prohibited and advertising and promotion should be strictly regulated.
- **health risks**, a regulatory framework needs to be created and enforced.
- **dual usage**, a regulatory framework needs to be created and enforced.
- **youth uptake**, sales to minors should be prohibited. E-liquid flavours attractive to youth should be banned and advertising and promotion should be strictly regulated.

There is a need for more information regarding the potential cessation benefits of e-cigarettes. The Heart and Stroke Foundation appreciates the regulations implemented by various provincial and municipal governments as well as the federal government's commitment to creating a regulatory framework for e-cigarettes, as it is critical that governments move quickly to regulate all e-cigarettes and commission further research.



References

1. Grana R, et al. E-Cigarettes: A Scientific Review. *Circulation*, 2014; 129:1972-1986.
2. Tobacco Control. May 2014, Volume 23, suppl 2.
3. Buettner-Schmidt K, Miller DR, Balasubramanian N. Electronic Cigarette Refill Liquids: Child-Resistant Packaging, Nicotine Content, and Sales to Minors. *Journal of pediatric nursing*. 2016 Apr 12.
4. Magennis P, BMS Sc SS. Retail availability and marketing of electronic cigarettes in Canada. *Canadian Journal of Public Health*. 2015 Sep 1;106(6):E408.
5. Kamboj A, Spiller HA, Casavant MJ, Chounthirath T, Smith GA. Pediatric exposure to e-cigarettes, nicotine, and tobacco products in the United States. *Pediatrics*. 2016 May 9:e20160041.
6. Yuan M, Cross SJ, Loughlin SE, Leslie FM. Nicotine and the adolescent brain. *The Journal of physiology*. 2015 Aug 15;593(16):3397-412.
7. England LJ, Bunnell RE, Pechacek TF, Tong VT, McAfee TA. Nicotine and the developing human: a neglected element in the electronic cigarette debate. *American journal of preventive medicine*. 2015 Aug 31;49(2):286-93.
8. Kandel D, Kandel E. The Gateway Hypothesis of substance abuse: developmental, biological and societal perspectives. *Acta Paediatrica*. 2015 Feb 1;104(2):130-7.
9. Canadian Cancer Society. (2014). The Canadian Cancer Society's exclusive study: 5,000 children have already tried an electronic cigarette in Grade 6! One in three high school students have already smoked it (142,000 youths). Retrieved August 21, 2014, from Canadian Cancer Society Web site: <http://www.cancer.ca/en/about-us/for-media/media-releases/quebec/2014/electronic-cigarette-study/?region=qc>
10. Khoury M, Manhiot C, Fan CPS, et al. Reported electronic cigarette use among adolescents in the Niagara region of Ontario. *CMAJ* 2016 July 18 [Epub ahead of print].
11. Magennis P, BMS Sc SS. Retail availability and marketing of electronic cigarettes in Canada. *Canadian Journal of Public Health*. 2015 Sep 1;106(6):E408.
12. Buettner-Schmidt K, Miller DR, Balasubramanian N. Electronic Cigarette Refill Liquids: Child-Resistant Packaging, Nicotine Content, and Sales to Minors. *Journal of pediatric nursing*. 2016 Apr 12.
13. Buettner-Schmidt K, Miller DR, Balasubramanian N. Electronic Cigarette Refill Liquids: Child-Resistant Packaging, Nicotine Content, and Sales to Minors. *Journal of pediatric nursing*. 2016 Apr 12.
14. Benowitz NL, Burbank AD. Cardiovascular toxicity of nicotine: Implications for electronic cigarette use. *Trends in cardiovascular medicine*. 2016 Mar 10.
15. US Department of Health and Human Services. The Health Consequences of Smoking: 50 Years of Progress: A Report of the Surgeon General. Atlanta, GA. Centers for Disease Control and Prevention. National Centre of Chronic Disease Prevention and Health Promotion. Office on Smoking and Health; 2014.
16. Polosa R. E-cigarettes: Public Health England's evidence based confusion?. *The Lancet*. 2015 Sep 26;386(10000):1237-8.
17. Nutt, DJ, Phillips, LD, Balfour, D et al. Estimating the harms of nicotine-containing products using the MCDA approach. *Eur Addict Res*. 2014; **20**: 218-225
18. Silagy C, Mant D, Fowler G, Lodge M. Meta-analysis on efficacy of nicotine replacement therapies in smoking cessation. *The Lancet*. 1994 Jan 15;343(8890):139-42.
19. Pechacek TF, Nayak P, Gregory KR, Weaver SR, Eriksen MP. The Potential That Electronic Nicotine Delivery Systems Can be a Disruptive Technology: Results From a National Survey. *Nicotine & Tobacco Research*. 2016 May 3:ntw102.
20. Kalkhoran S, Glantz SA. E-cigarettes and smoking cessation in real-world and clinical settings: a systematic review and meta-analysis. *The Lancet Respiratory Medicine*. 2016 Feb 29;4(2):116-28.
21. Tozzi, J. and Bachman, J. (2014, June 17) Big Tobacco Keeps Pushing Into E-Cigarettes. *Bloomberg Business Week*. Web site:<http://www.businessweek.com/articles/2014-06-17/big-tobacco-keeps-pushing-into-e-cigarettes>
22. Reid JL, Rynard VL, Czoli CD, Hammond D. Who is using e-cigarettes in Canada? Nationally representative data on the prevalence of e-cigarette use among Canadians. *Preventive medicine*. 2015 Dec 31;81:180-3.
23. Shiplo S, Czoli CD, Hammond D. E-cigarette use in Canada: prevalence and patterns of use in a regulated market. *BMJ open*. 2015 Aug 1;5(8):e007971.
24. Tozzi, J. and Bachman, J. (2014, June 17) Big Tobacco Keeps Pushing Into E-Cigarettes. *Bloomberg Business Week*. Web site:<http://www.businessweek.com/articles/2014-06-17/big-tobacco-keeps-pushing-into-e-cigarettes>
25. Euromonitor International. 2015. <http://blog.euromonitor.com/2015/06/vapor-devices-and-e-cigarettes-in-the-global-tobacco-market.html>
26. Vasiljevic M, Petrescu DC, Marteau TM. Impact of advertisements promoting candy-like flavoured e-cigarettes on appeal of tobacco smoking among children: an experimental study. *Tobacco control*. 2016 Jan 17:tobaccocontrol-2015.
27. Farrelly MC, Duke JC, Crankshaw EC, Eggers ME, Lee YO, Nonnemaker JM, Kim AE, Porter L. A randomized trial of the effect of e-cigarette TV advertisements on intentions to use e-cigarettes. *American journal of preventive medicine*. 2015 Nov 30;49(5):686-93.
28. Adkison SE, O'Connor RJ, Bansal-Travers M, Hyland A, Borland R, Yong HH, Cummings KM, McNeill A, Thrasher JF, Hammond D, Fong GT. Electronic nicotine delivery systems: international tobacco control four-country survey. *American Journal of Preventive Medicine*. 2013 Mar;44(3):207-15.
29. Czoli CD, Hammond D, White CM. Electronic cigarettes in Canada: Prevalence of use and perceptions among youth and young adults. *Canadian Journal of Public Health*. 2014 March/April;105(2):e97-e102.
30. Ontario Student Drug Use and Health Survey, 2015.
31. Barrington-Trimis JL, Berhane K, Unger JB, Cruz TB, Urman R, Chou CP, Howland S, Wang K, Pentz MA, Gilreath TD, Huh J. The E-cigarette Social Environment, E-cigarette Use, and Susceptibility to Cigarette Smoking. *Journal of Adolescent Health*. 2016 May 6.
32. Leventhal AM, Strong DR, Kirkpatrick MG, Unger JB, Sussman S, Riggs NR, Stone MD, Khoddam R, Samet JM, Audrain-McGovern J. Association of electronic cigarette use with initiation of combustible tobacco product smoking in early adolescence. *Jama*. 2015 Aug 18;314(7):700-7.
33. Primack BA, Soneji S, Stoolmiller M, Fine MJ, Sargent JD. Progression to traditional cigarette smoking after electronic cigarette use among US adolescents and young adults. *JAMA pediatrics*. 2015 Nov 1;169(11):1018-23.

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