



E-cigarette – for healthcare professionals

What is e-cigarette?

E-cigarette is an electrically powered device in which a coil is used to heat a chemical solution (“e-liquid”) to generate aerosol for inhalation by the user.

E-cigarettes come in various types and shapes. Some mimic traditional tobacco products such as cigarettes or cigars, and some look like daily household products such as pens and USB memory sticks.

Emission of E-cigarettes and Health Hazards

E-liquids may come in pre-filled cartridge/tank or refill bottles. They typically contain nicotine, chemical solvents (e.g. propylene glycol, glycerine) and flavourings. By heating the e-liquids, they are aerosolized, forming harmful products from thermal degradation, such as aldehydes (carcinogens), acrolein (an irritant), and benzene (a carcinogen). Metals (e.g. chromium, nickel) can be released from the heating coil when the device is used at high power.

Nicotine-containing e-cigarettes (or electronic nicotine delivery systems, “ENDS”) are highly addictive and have resulted in the rapid growth in youth use in some countries such as the United States. Some ENDS can deliver the same or even higher amount of nicotine at the similar rate as cigarettes.

The flavouring used in e-cigarettes are primarily food additives but their safety for inhalation purpose has not been proven. Moreover, some of these additives are identified to be toxic, such as diacetyl (buttery flavour), which causes bronchiolitis obliterans, and cinnamaldehyde (cinnamon flavour), which causes lung inflammation.

The composition of the aerosol depends on the device power, the users’ puffing behaviour, and the variety/concentration of chemicals present in the e-liquid.

E-cigarette, or vaping, product use-associated lung injury (EVALI)

Some e-cigarette devices can be used for inhalation of substances of the users' own choice. Use for smoking different forms of marijuana had been reported. In the United States, there were some 2 800 hospitalised cases of e-cigarette or vaping product use-associated lung injury (EVALI), including 68 deaths, reported as of 18 February 2020. Vitamin E acetate, an additive found in some tetrahydrocannabinol (“THC”, the ingredient in marijuana that causes a “high”)- containing e-cigarette, was identified to be closely associated with EVALI.

Other substance abuse

E-cigarette devices have even been used for drug abuse. E-liquid, mixed with drugs such as etomidate, a dangerous drug, can be inserted into e-cigarette devices and heated to generate aerosol for smoking.

Gateway and Renormalisation Effects

E-cigarettes are often colourfully packaged and flavoured (flavours such as bubble gum, fruit and candy) to increase their appeal to youngsters, and are promoted as being cool and fun. Use of e-cigarettes simulates the behavioural and sensory characteristics of conventional cigarette smoking. Studies showed that adolescents who used e-cigarettes were associated with a higher risk of initiating cigarette smoking later on, when compared to non-users.

Ban on alternative smoking products

Since 2022, no person may import, promote, manufacture, possess for commercial purposes or sell alternative smoking products, including electronic cigarette products; no person may use alternative smoking products in statutory no smoking areas. Starting 30 April 2026, no person may possess a specified alternative smoking product in a public place. Specified alternative smoking products include capsules and e-liquids of e-cigarettes, heat sticks, and herbal cigarettes, etc.

Pharmacy and Poisons Ordinance (Cap. 138)

In Hong Kong, nicotine-containing e-cigarette (excluding tobacco products) is considered pharmaceutical products under the Pharmacy and Poisons Ordinance (Cap. 138). Products which fall within the definition of “pharmaceutical product” must meet the standards of safety, efficacy and quality and be registered with the Pharmacy and Poisons Board before they can be sold or distributed in Hong Kong. All registered pharmaceutical products should carry a Hong Kong registration number on the package in the format of “HK-XXXXX”. Those unregistered products have not been evaluated, and their safety, quality and efficacy could not be guaranteed.

Besides, nicotine (except tobacco) is categorised as a Part I poison under Cap. 138. Illegal possession or sale of Part I poisons or unregistered pharmaceutical products constitutes an offence. The maximum penalty for each offence on conviction is a fine of \$100,000- and two-years' imprisonment.

Further, import or export of pharmaceutical products is controlled under the provisions of the Import and Export Ordinance (Cap. 60). Importation / Exportation of these products must be covered by an import / export licence. Any person importing or exporting of pharmaceutical products without a licence may commit an offence. The person who is found guilty shall be liable to a fine at HK\$500,000 and to imprisonment for 2 years.

Role of e-cigarettes in smoking cessation

Evidence on the effect of e-cigarettes on smoking cessation remains inconclusive. It is not clear whether e-cigarettes can assist smokers quitting. Smokers who are attempting to quit should be provided with established smoking cessation aids, including various nicotine replacement therapies, Varenicline, and counselling, which are rigorously tested for their safety, quality, and effectiveness.

What can Healthcare Professionals Do?

As a healthcare professional, I can...

- Advise patients at every opportunity to completely quit using all tobacco products
- Discuss the harms of e-cigarettes with patients and that e-cigarettes are not an effective smoking cessation tool
- Provide cessation support that suits the patient's need
- Referral to smoking cessation services (1833 183)
- Go to www.livetobaccofree.hk to know more

How do e-cigarette manufacturers attract young people?

- Research showed that design and flavour are the main factors that attract young people to use e-cigarettes.
- Nicotine in e-cigarettes is highly addictive.
- Attract young people with the trendy design of electronic devices.

All content and information contained in this publication are protected by copyright, of which the owner is the Tobacco and Alcohol Control Office of Department of Health, Government of the Hong Kong Special Administrative Region.

Reference

- 1) National Academies of Sciences Engineering, and Medicine. Public health consequences of e-cigarettes Washington, DC: The National Academies Press; 2018.
- 2) U.S. Department of Health and Human Services. *E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- 3) 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;169(11):1018-1023.
- 4) Conner M, Grogan S, Simms-Ellis R, Flett K, Sykes-Muskett B, Cowap L, et al. Do electronic cigarettes increase cigarette smoking in UK adolescents? Evidence from a 12-month prospective study. *Tobacco Control*. 2018;27(4):365-72.
- 5) WHO Study Group on Tobacco Product Regulation. Report on the scientific basis of tobacco product regulation: seventh report of a WHO study group. Geneva: World Health Organization; 2019 (WHO Technical Report Series, No. 1015). Licence: CC BY-NC-SA 3.0 IGO.
- 6) Gotts JE, Jordt SE, McConnell R, Tarran R. What are the respiratory effects of e-cigarettes? *BMJ* 2019;366:l5275.
- 7) Brown CJ, Cheng JM. Electronic cigarettes: product characterisation and design considerations. *Tobacco Control*. 2014;23:ii4-ii10.
- 8) Williams M, Bozhilov K, Ghai S, Talbot P. Elements including metals in the atomizer and aerosol of disposable electronic cigarettes and electronic hookahs. *PLoS ONE*. 2017; 12(4): e0175430. <https://doi.org/10.1371/journal.pone.0175430>
- 9) World Health Organization. WHO study group on tobacco product regulation: report on the scientific basis of tobacco product regulation: eighth report of a WHO study group. Geneva; 2021.