

E-cigarette Information Sheet

Australian Association of Smoking Cessation Professionals | April 2014

The Australian Association of Smoking Cessation Professionals (AASCP) has prepared the following information on electronic cigarettes to help individual smokers and health professionals make informed, evidence-based decisions about the use of these products. This information is current at the time of writing but is changing constantly as more research becomes available.

What are electronic cigarettes?

Electronic cigarettes (e-cigarettes) are battery operated devices that create a mist for inhalation which usually contains nicotine. E-cigarette use ('vaping') mimics the behavioural and sensory aspects of smoking and simulates a 'smoking' experience. (1)

E-cigarettes use either disposable or refillable cartridges ('tanks') containing nicotine (typically 0-24mg) and/or flavourings dissolved in propylene glycol and/or glycerin. When puffed, the liquid is heated into a fine vapour that is inhaled into the lungs. The vapour does not contain carbon monoxide or the other toxic products of combustion in tobacco smoke and is exhaled as a visible mist, simulating cigarette smoke. Some models also have an LED light at the tip that glows during inhalation.

With the right puffing technique and technical specifications of the device, e-cigarettes that contain nicotine can deliver as much nicotine as regular cigarettes. (2-5) Nicotine is delivered from e-cigarettes more quickly than most forms of NRT (4, 6, 7), but slower than from smoking. (8)

A recent study found that 20% of Australian smokers had tried e-cigarettes and 7% of Australian smokers currently use them (9) and their uptake is increasing dramatically. More than 400 e-cigarette brands are on the market and the technology is evolving rapidly.

What are they used for?

E-cigarette users ('vapers') employ them for four main purposes (10-13):

1. Smoking cessation: as an aid for quitting.
2. Harm reduction: to reduce the number of traditional cigarettes smoked.
3. Relapse prevention: as a long-term replacement for smoking after quitting.

4. Temporary abstinence: for temporary relief in places where smoking is banned.

Do they work?

Many users report that e-cigarettes have helped them to quit or reduce their smoking. (10, 11, 13) A small number of scientific trials have shown some promise; however the level of evidence is not yet sufficient to conclude that they are an effective smoking cessation aid.

A randomised controlled trial of 657 smokers found e-cigarettes were modestly effective in helping motivated smokers to quit and had a similar effectiveness to nicotine patches. (14) Quit rates at six months were 7.3% for the active e-cigarette (containing 16mg nicotine), 5.8% for the 21mg nicotine patch and 3.6% for placebo e-cigarette (no nicotine). Quit rates were low overall reflecting the lack of support and counselling provided. In addition, 57% of participants in the active group reduced tobacco cigarette consumption by at least half after 6 months.

Two trials have shown that e-cigarettes can help smokers to reduce their cigarette intake. A randomised controlled trial of 300 smokers who were not interested in quitting, found that 14.5% of smokers of active e-cigarettes and 12% of placebo e-cigarette users cut down their smoking by $\geq 50\%$ after 12 months. (15)

A smaller real-world cohort study of 40 smokers found a larger reduction in cigarette intake after 24 months. (16) In addition, 5-9% of smokers quit altogether in the two studies.

Numerous studies have shown that e-cigarettes (even nicotine-free models) can reduce the desire to smoke (cravings) and withdrawal symptoms such as irritability and restlessness. (4-8, 13, 14)

Australian Association of Smoking Cessation Professionals

PO Box M195, Missenden Rd, Camperdown NSW 2050

E: admin@aascp.org.au | Tel: (02) 9351 0816

www.aascp.org.au



AASCP AUSTRALIAN
ASSOCIATION OF
SMOKING CESSATION
PROFESSIONALS
TOBACCO TREATMENT SPECIALISTS

E-cigarette Information Sheet

Australian Association of Smoking Cessation Professionals | April 2014

Are e-cigarettes safe?

E-cigarettes are likely to be much safer than smoking, however there are no long-term studies and further research on safety is needed. Nicotine is the key addictive component of tobacco, but otherwise it has relatively minor adverse health effects, except in pregnancy. Nicotine does not cause cancer, lung disease and has only relatively minor cardiovascular effects. (17)

E-cigarettes do not produce carbon monoxide (6, 8) but small amounts of toxic compounds have been found in the vapour from some brands. (18, 19) However, the levels are substantially less than those in cigarette smoke, and in many cases comparable with the levels in NRT. (18, 19)

E-cigarettes are generally well tolerated by users. Mild transient symptoms such as dry cough, mouth and throat irritation have been reported. (6, 20, 21) No abnormal changes in blood pressure, haematological data and blood chemistry have been found. (22) The rate of side effects from the nicotine e-cigarette was similar to that of nicotine patches in one trial. (14)

As e-cigarettes deliver nicotine more slowly than cigarettes they have lower potential for abuse than traditional cigarettes. (7, 8)

Is there a risk from passive vaping?

E-cigarettes release significant amounts of nicotine into the surrounding air. (2, 23) However, the level of toxic substances is very low and there is no carbon monoxide. (18, 23) The long-term health effects of these emissions are unknown, but they are likely to be much safer than second-hand smoke exposure. (24)

What are the concerns about their use?

E-cigarettes are not regulated in Australia and there are concerns about the quality of some products, such as inadequate and inaccurate labelling (25, 26), the presence of impurities (27), leaking cartridges (26) and poisoning from nicotine containers that are not childproof. (13)

There are also serious concerns about the potential detrimental effects of widespread e-cigarette use on public health:

- E-cigarettes may act as a gateway to smoking, where (13, 28-30) non-smokers, particularly young people, may try them and become long-term nicotine users with e-cigarettes or cigarette smokers. However there is no evidence of this so far.
- The use of e-cigarettes in public places and social settings could renormalise smoking behaviour and possibly increase cigarette use in the community. There is also no evidence of this so far.
- E-cigarettes may discourage quitting in some people by helping maintain their addiction in non-smoking areas or diverting them from the use of effective forms of treatment. (31) There is no evidence for this at the current time.
- Instead of quitting, smokers may continue to use both e-cigarettes and a reduced cigarette intake long term (dual use). Reducing daily smoking has not been shown to deliver a significant health benefit. (32)
- There is also considerable concern about the increasing control of e-cigarettes by the tobacco industry, which has a long history of deceit and misinformation. Its agenda appears to be to grow the market for both conventional and e-cigarettes.

Are they legal in Australia?

E-cigarettes are not approved as therapeutic products but they can be purchased legally without nicotine at retail outlets in Australia. The sale of nicotine is prohibited so most products sold are nicotine-free. E-cigarettes with nicotine or nicotine refill solutions can be ordered online and imported for personal use. (33) However, in some states and territories, obtaining, purchasing, possession and/or using nicotine without a permit is an offence.

Increasingly e-cigarette use is being banned in public areas and in the workplace.

Australian Association of Smoking Cessation Professionals

PO Box M195, Missenden Rd, Camperdown NSW 2050

E: admin@aascp.org.au | Tel: (02) 9351 0816

www.aascp.org.au



AASCP AUSTRALIAN
ASSOCIATION OF
SMOKING CESSATION
PROFESSIONALS
TOBACCO TREATMENT SPECIALISTS

E-cigarette Information Sheet

Australian Association of Smoking Cessation Professionals | April 2014

Advice to smokers

Conventional forms of nicotine replacement therapy (nicotine patch, lozenge, gum, mouth spray and inhalator) and the prescription drugs varenicline and bupropion have been evaluated by Australian authorities for quality, safety and performance and are the recommended first line medications for smokers wishing to quit. (33, 34) However, for those who have failed to quit with current approved therapies, e-cigarettes may offer an alternative.

E-cigarettes may also reduce harm from smoking by helping those who are not ready to quit to cut down their cigarette intake, although the health benefits of this are not proven. (35) Some smokers who cut down while using e-cigarettes will go on to quit completely as a result. Complete tobacco cessation is always the preferred goal for smokers.

However, there are still many unanswered questions about the effectiveness and safety of e-cigarettes and their overall impact on public health remains controversial. The final decision to use e-cigarettes belongs to the individual smoker, who should weigh up the risk and benefits and make a decision for their circumstances.

References

1. Caponnetto P, Campagna D, Papale G, Russo C, Polosa R. The emerging phenomenon of electronic cigarettes. Expert review of respiratory medicine. 2012 Feb;6(1):63-74. PubMed PMID: 22283580. Epub 2012/01/31. eng.
2. Flouris AD, Chorti MS, Poulianiti KP, Jamurtas AZ, Kostikas K, Tzatzarakis MN, et al. Acute impact of active and passive electronic cigarette smoking on serum cotinine and lung function. Inhalation toxicology. 2013 Feb;25(2):91-101. PubMed PMID: 23363041. Epub 2013/02/01. eng.
3. Etter JF, Bullen C. Saliva cotinine levels in users of electronic cigarettes. The European respiratory journal. 2011 Nov;38(5):1219-20. PubMed PMID: 22045788. Epub 2011/11/03. eng.
4. Vansickel AR, Eissenberg T. Electronic cigarettes: effective nicotine delivery after acute administration. Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco. 2013 Jan;15(1):267-70. PubMed PMID: 22311962. Pubmed Central PMCID: PMC3524053. Epub 2012/02/09. eng.
5. Dawkins L, Corcoran O. Acute electronic cigarette use: nicotine delivery and subjective effects in regular users. Psychopharmacology. 2014 Jan;231(2):401-7. PubMed PMID: 23978909. Epub 2013/08/28. eng.
6. Nides M, Leischow S, Bhattar M, Simmons M. Nicotine Blood Levels and Short-term Smoking Reduction with an Electronic Nicotine Delivery System. Am J Health Behav. 2014;38(2):265-74.
7. Bullen C, McRobbie H, Thornley S, Glover M, Lin R, Laugesen M. Effect of an electronic nicotine delivery device (e cigarette) on desire to smoke and withdrawal, user preferences and nicotine delivery: randomised cross-over trial. Tobacco control. 2010 Apr;19(2):98-103. PubMed PMID: 20378585. Epub 2010/04/10. eng.
8. Vansickel AR, Weaver MF, Eissenberg T. Clinical laboratory assessment of the abuse liability of an electronic cigarette. Addiction (Abingdon, England). 2012 Aug;107(8):1493-500. PubMed PMID: 22229871. Pubmed Central PMCID: PMC3330136. Epub 2012/01/11. eng.
9. Gravely S, Fong G, Tait Y, Quah A, Hammond D, Cummings K, et al. Awareness, Ever-Trial and Use of Electronic Cigarettes among 10 countries: Findings from the ITC Project. Annual SRNT Meeting Seattle, USA 2014.
10. Adkison SE, O'Connor RJ, Bansal-Travers M, Hyland A, Borland R, Yong HH, et al. Electronic nicotine delivery systems: international tobacco control four-country survey. American journal of preventive medicine. 2013 Mar;44(3):207-15. PubMed PMID: 23415116. Pubmed Central PMCID: PMC3627474. Epub 2013/02/19. eng.
11. Etter JF, Bullen C. Electronic cigarette: users profile, utilization, satisfaction and perceived efficacy. Addiction (Abingdon, England). 2011 Nov;106(11):2017-28. PubMed PMID: 21592253. Epub 2011/05/20. eng.
12. Kralikova E, Novak J, West O, Kmetova A, Hajek P. Do e-Cigarettes Have the Potential to Compete With Conventional Cigarettes?: A Survey of Conventional Cigarette Smokers' Experiences With e-Cigarettes. Chest. 2013 Nov 1;144(5):1609-14. PubMed PMID: 23868661. Epub 2013/07/23. eng.
13. Pepper JK, Brewer NT. Electronic nicotine delivery system (electronic cigarette) awareness, use, reactions and beliefs: a systematic review. Tobacco control. 2013 Nov 20. PubMed PMID: 24259045. Epub 2013/11/22. Eng.
14. Bullen C, Howe C, Laugesen M, McRobbie H, Parag V, Williman J, et al. Electronic cigarettes for smoking cessation: a randomised controlled trial. Lancet. 2013 Nov 16;382(9905):1629-37. PubMed PMID: 24029165. Epub 2013/09/14. eng.
15. Caponnetto P, Campagna D, Cibella F, Morjaria JB, Caruso M, Russo C, et al. Efficiency and Safety of an eElectronic cigAreTte (ECLAT) as tobacco cigarettes substitute: a prospective 12-month randomized control design study.

Australian Association of Smoking Cessation Professionals

PO Box M195, Missenden Rd, Camperdown NSW 2050

E: admin@aascp.org.au | Tel: (02) 9351 0816

www.aascp.org.au



AASCP AUSTRALIAN
ASSOCIATION OF
SMOKING CESSATION
PROFESSIONALS
TOBACCO TREATMENT SPECIALISTS

E-cigarette Information Sheet

Australian Association of Smoking Cessation Professionals | April 2014

- PLoS one. 2013;8(6):e66317. PubMed PMID: 23826093. Pubmed Central PMCID: PMC3691171. Epub 2013/07/05. eng.
16. Polosa R, Morjaria JB, Caponnetto P, Campagna D, Russo C, Alamo A, et al. Effectiveness and tolerability of electronic cigarette in real-life: a 24-month prospective observational study. *Internal and emergency medicine*. 2013 Jul 20. PubMed PMID: 23873169. Epub 2013/07/23. Eng.
 17. Zwar N, Bell J, Peters M, Christie M, Mendelsohn C. Nicotine and nicotine replacement therapy – the facts. *Australian Pharmacist*. 2006;25(12):969-73.
 18. Goniewicz ML, Knysak J, Gawron M, Kosmider L, Sobczak A, Kurek J, et al. Levels of selected carcinogens and toxicants in vapour from electronic cigarettes. *Tobacco control*. 2013 Mar 6. PubMed PMID: 23467656. Epub 2013/03/08. Eng.
 19. Cahn Z, Siegel M. Electronic cigarettes as a harm reduction strategy for tobacco control: a step forward or a repeat of past mistakes? *Journal of public health policy*. 2011 Feb;32(1):16-31. PubMed PMID: 21150942. Epub 2010/12/15. eng.
 20. Polosa R, Caponnetto P, Morjaria JB, Papale G, Campagna D, Russo C. Effect of an electronic nicotine delivery device (e-Cigarette) on smoking reduction and cessation: a prospective 6-month pilot study. *BMC public health*. 2011;11:786. PubMed PMID: 21989407. Pubmed Central PMCID: PMC3203079. Epub 2011/10/13. eng.
 21. Farsalinos KE, Romagna G, Tsiapras D, Kyrzopoulos S, Voudris V. Evaluating nicotine levels selection and patterns of electronic cigarette use in a group of "vapers" who had achieved complete substitution of smoking. *Substance abuse : research and treatment*. 2013;7:139-46. PubMed PMID: 24049448. Pubmed Central PMCID: PMC3772898. Epub 2013/09/21. eng.
 22. Miura K, Kikukawa Y, Nakao T. Safety assessment of electronic cigarettes in smokers. *Journal of Urban Living and Health Association*. 2011;55(1):1442-58.
 23. Czogala J, Goniewicz ML, Fidelus B, Zielinska-Danch W, Travers M, Sobczak A. Secondhand Exposure to Vapors From Electronic Cigarettes. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco*. 2013. Epub December 11, 2013.
 24. Burstyn I. Peering through the mist: systematic review of what the chemistry of contaminants in electronic cigarettes tells us about health risks. *BMC public health*. 2014 Jan 9;14(1):18. PubMed PMID: 24406205. Epub 2014/01/11. Eng.
 25. Goniewicz ML, Kuma T, Gawron M, Knysak J, Kosmider L. Nicotine levels in electronic cigarettes. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco*. 2013 Jan;15(1):158-66. PubMed PMID: 22529223. Epub 2012/04/25. eng.
 26. Trtchounian A, Talbot P. Electronic nicotine delivery systems: is there a need for regulation? *Tobacco control*. 2011 Jan;20(1):47-52. PubMed PMID: 21139013. Epub 2010/12/09. eng.
 27. Westenberger B. Evaluation of e-cigarettes. St Louis. Food and Drug Administration. 2009.
 28. Morbidity and Mortality Weekly Report. Electronic Cigarette Use Among Middle and High School Students — United States, 2011–2012. Vol 62; No 35. September 6, 2013.
 29. Lee S, Grana RA, Glantz SA. Electronic Cigarette Use Among Korean Adolescents: A Cross-Sectional Study of Market Penetration, Dual Use, and Relationship to Quit Attempts and Former Smoking. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine*. 2013 Nov 22. PubMed PMID: 24274973. Epub 2013/11/28. Eng.
 30. Choi K, Forster J. Beliefs and Experimentation with Electronic Cigarettes. A Prospective Analysis Among Young Adults. *American journal of preventive medicine*. 2014;46(2):175-8.
 31. Cobb NK, Abrams DB. E-cigarette or drug-delivery device? Regulating novel nicotine products. *The New England journal of medicine*. 2011 Jul 21;365(3):193-5. PubMed PMID: 21774706. Epub 2011/07/22. eng.
 32. Bjartveit K, Tverdal A. Health consequences of smoking 1-4 cigarettes per day. *Tobacco control*. 2005 Oct;14(5):315-20. PubMed PMID: 16183982. Pubmed Central PMCID: PMC1748107. Epub 2005/09/27. eng.
 33. TGA. Electronic Cigarettes. <http://www.tga.gov.au/consumers/ecigarettes.htm#Uq48XuJZRDO>. 2013.
 34. Zwar N, Richmond R, Borland R, Peters M, Litt J, Bell J, et al. Supporting smoking cessation: a guide for health professionals. Melbourne: The Royal Australian College of General Practitioners. 2011.
 35. Stead LF, Lancaster T. Interventions to reduce harm from continued tobacco use. *Cochrane database of systematic reviews (Online)*. 2007 (3):CD005231. PubMed PMID: 17636791. Epub 2007/07/20. eng.

Australian Association of Smoking Cessation Professionals

PO Box M195, Missenden Rd, Camperdown NSW 2050

E: admin@aascp.org.au | Tel: (02) 9351 0816

www.aascp.org.au



AASCP AUSTRALIAN
ASSOCIATION OF
SMOKING CESSATION
PROFESSIONALS
TOBACCO TREATMENT SPECIALISTS