



TITLE: Electronic Cigarettes: Clinical Evidence and Safety

DATE: 30 September 2011

RESEARCH QUESTIONS

1. What is the clinical evidence regarding the utility of electronic cigarettes for smoking cessation?
2. What is the clinical evidence regarding the safety and harms associated with electronic cigarettes and the associated cartridges?

KEY MESSAGE

The clinical evidence regarding the utility and safety of electronic cigarettes and the associated cartridges was limited; however, evidence suggests that electronic cigarettes may be an effective and safe means for smoking cessation.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2011, Issue 9), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and abbreviated list of major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. The search was also limited to English language documents published between Jan 1, 2006 and Sept 23, 2011. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

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RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials and non-randomized studies. One randomized controlled trial and two non-randomized studies were identified regarding the utility and safety of electronic cigarettes (e-cigarettes) and the associated cartridges for smoking cessation. No health technology assessments, systematic reviews, or meta-analyses were identified. Additional literature of interest is located in the appendix.

OVERALL SUMMARY OF FINDINGS

One randomized controlled trial¹ assessed the short-term effects of e-cigarettes on smoking desire, withdrawal symptoms, acceptability, pharmacokinetic properties and adverse effects. The authors found that the use of e-cigarettes lessened the desire to smoke and was generally well tolerated. Compared to a nicotine inhaler the authors found that e-cigarettes were more enjoyable to use and produced less irritation to the throat and mouth.

One non-randomized study² examined the effectiveness of e-cigarettes for smoking cessation. Using a survey for subjects who have used e-cigarettes, the authors found a large proportion of respondents reported a reduction in total number of cigarettes smoked or abstinence from smoking for some period of time. The authors concluded that e-cigarettes may be considered a method for smoking cessation and warrant future studies. Another non-randomized controlled study³ evaluated the acute effects of e-cigarettes. It was found that e-cigarette users were not exposed to measurable levels of nicotine or carbon monoxide, yet had suppressed nicotine/tobacco abstinence symptom ratings.

REFERENCES SUMMARIZED

Health Technology Assessments

No literature identified

Systematic Reviews and Meta-analyses

No literature identified

Randomized Controlled Trials

1. 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. *Tob Control*. 2010 Apr;19(2):98-103.
[PubMed: PM20378585](#)

Non-Randomized Studies

2. Siegel MB, Tanwar KL, Wood KS. Electronic cigarettes as a smoking-cessation: tool results from an online survey. *Am J Prev Med*. 2011 Apr;40(4):472-5.
[PubMed: PM21406283](#)
3. Vansickel AR, Cobb CO, Weaver MF, Eissenberg TE. A clinical laboratory model for evaluating the acute effects of electronic "cigarettes": nicotine delivery profile and cardiovascular and subjective effects. *Cancer Epidemiol Biomarkers Prev [Internet]*. 2010 Aug [cited 2011 Sep 23];19(8):1945-53. Available from:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2919621>
[PubMed: PM20647410](#)

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APPENDIX – FURTHER INFORMATION:

Review Articles

4. Cahn Z, Siegel M. Electronic cigarettes as a harm reduction strategy for tobacco control: a step forward or a repeat of past mistakes? *J Public Health Policy*. 2011 Feb;32(1):16-31. [PubMed: PM21150942](#)
5. Kuschner WG, Reddy S, Mehrotra N, Paintal HS. Electronic cigarettes and thirdhand tobacco smoke: two emerging health care challenges for the primary care provider. *Int J Gen Med* [Internet]. 2011 [cited 2011 Sep 23];4:115-20. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3068875>
[PubMed: PM21475626](#)
6. Rodu B. The scientific foundation for tobacco harm reduction, 2006-2011. *Harm Reduct J* [Internet]. 2011 [cited 2011 Sep 23];8:19. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3161854>
[PubMed: PM21801389](#)
7. Council on Science and Public Health. Use of electronic cigarettes in smoking cessation programs [Internet]. Chicago (IL): American Medical Association; 2010 [cited 2011 Sep 23]. Report No.: 6-A-10 Available from: <http://www.ama-assn.org/resources/doc/csaph/a10csaph6ft.pdf>

Additional References

8. Etter JF, Bullen C. Electronic cigarette: users profile, utilization, satisfaction and perceived efficacy. *Addiction*. 2011 May 18. Epub ahead of print. [PubMed: PM21592253](#)
9. Westenberger BJ. Evaluation of e-cigarettes [Internet]. St.Louis (MO): Food and Drug Administration, Center for Drug Evaluation and Research, Division of Pharmaceutical Analysis; 2009 [cited 2011 Sep 23]. Available from: <http://www.fda.gov/downloads/Drugs/ScienceResearch/UCM173250.pdf>