

A summary of the Cochrane Living Systematic Review of 'Electronic cigarettes for smoking cessation' and associated work

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The Cochrane review of e-cigarettes for smoking cessation: background

In 2014, the Cochrane Tobacco Addiction Group published the first iteration of their review of 'Electronic cigarettes for smoking cessation'. This review looks at people who were smoking at the start of studies and were asked to use an e-cigarette to help them quit smoking, sometimes in comparison to other smoking cessation aids. It has now been updated a number of times and converted into a Living Systematic Review, funded by Cancer Research UK. This means that the author team search the literature every month and incorporate new evidence into the review on a regular basis. The most recent update of the review was published in November 2022 and is available here: <https://bit.ly/cochraneEC>. The author team are made up of experts from the UK, Australia, New Zealand, and the US (University of Oxford, Harvard University, Queen Mary University of London, University of East Anglia, University of Auckland, University of New South Wales, Monash University). All of the experts are independent academics with no ties to the e-cigarette or tobacco industry.

Key findings of the review

In summary, the findings of the review are as follows:

- There is high certainty evidence that more people stop smoking for at least six months using nicotine e-cigarettes than using nicotine replacement therapy (NRT, such as patches, gum, or lozenges) (6 studies, 2378 people). There is moderate certainty evidence that more people stop smoking for at least six months using nicotine e-cigarettes than nicotine-free e-cigarettes (5 studies, 1447 people).

- Nicotine e-cigarettes may also help more people to stop smoking than no stop smoking support or behavioural support to stop smoking only (7 studies, 3126 people).
- For every 100 people using nicotine e-cigarettes to stop smoking, 9 to 14 might successfully stop, compared with only 6 of 100 people using nicotine-replacement therapy, 7 of 100 using nicotine-free e-cigarettes, or four of 100 people receiving no support or behavioural support only.
- The evidence is insufficient to determine if there is a difference between how many unwanted effects occur using nicotine e-cigarettes compared with other treatments. However, there is some evidence of similar low numbers of unwanted effects, including serious unwanted effects, when comparing nicotine e-cigarettes to NRT (a well-established, widely used smoking cessation treatment).
- None of the included studies (up to two years in length) detected serious adverse events considered possibly related to e-cigarette use. There was some evidence of non-serious unwanted effects of using nicotine e-cigarettes, such as irritation, headache, cough and feeling sick, which tended to dissipate with continued use. These are also recognised side effects of NRT. The certainty of the evidence is limited by small numbers of studies, with low numbers of events; therefore further evidence is needed to increase certainty in these findings.
- In some studies, reduced toxin concentrations and biomarkers of harm were observed in people who smoked and switched to vaping, consistent with reductions seen in smoking cessation.

Recent additional work and findings

The Cochrane team received funding from the University of Oxford's Policy Exchange Fund to carry out additional policy-relevant analyses based on topics suggested by the tobacco control lead for Office for Health Improvements and Disparities (OHID) and by Action on Smoking and Health. We set out to answer the following questions:

- 1) How many people continue to use e-cigarettes at six months or longer after their provision as a smoking cessation aid?
- 2) Are the effectiveness and long-term use of e-cigarettes associated with the flavour of e-cigarettes used in a quit attempt?
- 3) Are biomarkers of exposure and harm associated with patterns of combustible cigarette and e-cigarette use in people who attempt to quit smoking using e-cigarettes? (i.e. continued combustible cigarette use; switching to e-cigarettes only; dual use of combustible cigarettes and e-cigarettes)?

Findings from these analyses are currently under review and therefore are being shared in confidence and should be understood to be subject to change. They are summarized briefly below.

- Long-term use of e-cigarettes

Among people given an e-cigarette to help them stop smoking, just over half (54%) were still using an e-cigarette 6 months later. Among those who had successfully stopped smoking, the proportion still using e-cigarettes 6 months later was even greater at 70%.

This longer-term use could be a mechanism of EC success, by preventing relapse to smoking. Long-term use may have safety implications, but this should be considered alongside the known negative effects of continued tobacco smoking.

- E-cigarette flavours and smoking cessation

Evidence is lacking on the impact of e-cigarette flavours on someone's likelihood of stopping smoking. When people were offered a choice of e-cigarette flavour there was no clear preference for specific flavours and no clear association between flavour choice and quitting smoking.

- Levels of toxicants in people using e-cigarettes to stop smoking

Levels of carbon monoxide (CO) were significantly lower among people who stopped smoking using an e-cigarette than among people who continued to solely smoke combustible cigarettes or in people using e-cigarettes while continuing to smoke.

Levels of other tobacco-associated toxicants were also significantly lower among people using e-cigarettes compared to people who continued smoking. Levels of most toxicants were lower among people solely using e-cigarettes than in people using both e-cigarettes and combustible cigarettes. The evidence did not show that people who were using e-cigarettes and smoking (dual use) were exposed to more harmful toxicants than those only smoking.

An ongoing summary of the findings of the Cochrane living systematic review of 'Electronic cigarettes for smoking cessation' and associated dissemination, including up-to-date briefing documents for members of the public, clinicians and policy makers, is available at https://bit.ly/CEBM_EC.

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