

Electronic cigarettes: what we know so far

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This paper summarises evidence relating to key issues surrounding e-cigarettes. It will be updated as new information emerges. Updated versions are made available on www.smokinginengland.info.

Safety: E-cigarettes are much less harmful than smoking but not 100% safe

1. From the concentrations of potentially harmful inhalants in vapour, e-cigarette use from brands that have been tested so far would be expected much less harmful to health than smoking tobacco cigarettes (1-3). Well publicised reports of potential harmfulness of e-cigarette vapour have typically not compared this with tobacco cigarettes and/or have set up conditions that rarely occur in practice, e.g. (4). The precise extent of harm from long-term use is not known but has been estimated at around 1/20th that of smoking tobacco cigarettes (5).
2. Case reports suggest that a small proportion (estimated at less than 1/100,000) of e-cigarette users appear to suffer from serious though reversible acute adverse reactions to the vapour (6).
3. A substantial minority of e-cigarette users experience minor adverse reactions to the vapour (predominantly dry throat) (6).
4. Cases of poisoning from consuming the nicotine liquid from e-cigarettes have been reported; so far one unconfirmed case of fatal poisoning in a child has been reported by media and one case of fatal poisoning in an adult drinking estimated 10,800 mg of nicotine has been documented (7).
5. Several cases of the lithium-ion battery in an e-cigarette 'exploding' has been reported; the rate of such events is estimated at less than 1 per million e-cigarettes sold (6, 7)
6. The vapour exhaled by e-cigarette users contains chemicals such as nicotine which are below concentrations expected to cause significant harm to health of bystanders (6).

Use among never-smokers: Use of e-cigarettes by never smokers remains rare in the UK and US

7. US surveys indicate that there has been an increase in experimentation and recent (past 30-day) use by never smokers in recent years (8-10). Regular use by never smokers remains extremely rare at well below 1% (8).
8. Surveys of 11-14 year olds in Britain show that almost no never smokers report current use (11).
9. In England, prevalence of e-cigarette current use among never smokers aged 16+ is currently 0.2% which is similar to use of licensed nicotine products (12).
10. In the UK and US, the proportion of adolescents who smoke traditional cigarettes has continued to decline at least as fast as previously making it unlikely that e-cigarettes are acting as a gateway into smoking at a population level (13, 14).

Use among smokers: Use of e-cigarettes by smokers is common (10-20%) but in England prevalence has not increased over the past 18 months

11. Surveys in different countries have put prevalence of current e-cigarette use among smokers at 10-20% (6); prevalence in England is currently 18% and has not increased since the third quarter of 2013 (12).
12. In England (which has the most comprehensive data) approximately 30% of attempts to stop smoking in the past year have involved e-cigarettes (12). This is higher than use of any other aid to cessation.

13. The most common reason for using e-cigarettes is to reduce health risks of smoking (by stopping smoking completely and or reducing smoking) (8, 15).

Product types: E-cigarettes vary widely in appearance and nicotine delivery

14. There are a wide variety of e-cigarettes currently being used ranging from those that look like cigarettes to ones that bear little resemblance to cigarettes; the characteristics of these devices differ markedly, appealing to different types of smokers; most appear to deliver lower nicotine doses than from smoking but some e-cigarette users can obtain doses of nicotine similar to those typically found with smoking (6, 16)

Effect on attempts to stop smoking: The advent of e-cigarettes has not had a detectable impact on quit attempt rates

15. Smokers who currently also use e-cigarettes are more likely to try to stop smoking than those who have used neither an e-cigarette nor a licensed nicotine product (6, 15). The growth in e-cigarette prevalence in England has been accompanied by an increase to 2014 and a decline so far in 2015 in the rate at which smokers try to stop smoking. The marked difference in trajectories suggests that growth of e-cigarette use has not had a clear influence on quit attempt rates (12).

Effectiveness as an aid to smoking cessation: Use of e-cigarettes in a quit attempt is associated with increased abstinence rates compared with using no aid or licensed nicotine product bought from a store or placebo (nicotine-free) e-cigarettes

16. Smokers in England who use e-cigarettes in a quit attempt are approximately 50% more likely to remain abstinent from cigarettes for at least a few months than those who try to quit unaided or using a licensed nicotine product bought from a store, but probably less likely than those who attend high quality specialist stop-smoking support of the kind available in England (15). This may mask marked individual differences in chances of success with different methods.
17. Randomised controlled trials of now obsolete e-cigarettes in the context of some professional support suggest that those had a significant effect on cessation compared to placebo (e-cigarettes without nicotine) and had broadly similar levels of efficacy to licensed nicotine replacement products (6).
18. The increase in e-cigarette use to aid quitting in England has been associated with an increase in the population smoking cessation rate, though this could be due to other factors (12).

Effect of use while continuing to smoke: Use of e-cigarettes while smoking appears to be associated with a small reduction in cigarette consumption; its effect on subsequent smoking cessation is not clear

19. Several studies have found that dual e-cigarette use and smoking was associated with a reduced probability of subsequent smoking cessation, e.g. (16). This could be because dual use reduces ability to stop smoking or smokers who also use e-cigarettes are more addicted to cigarettes and the e-cigarettes they use are insufficient to counteract this. In support of this hypothesis, daily use of 2nd generation, more advanced e-cigarettes has been found in one study to be positively associated with subsequent cessation while non-daily use of first generation 'cigalike' models was negatively associated with cessation (17, 18).
20. Smokers who use e-cigarettes smoke slightly fewer cigarettes on average than when they did not use them (19). In two RCTs smokers allocated to e-cigarettes were more likely to reduce their cigarette consumption by 50% or more than smokers allocated to placebo e-cigarette or to nicotine patches (6).

User groups: There are highly active e-cigarette user groups who oppose highly restrictive regulation

21. There are several active e-cigarette user groups with enthusiastic advocates who share information about products and techniques for use, and argue to protect e-cigarette use against regulation that is as, or more, restrictive than regulation of cigarettes.

Marketing: E-cigarettes are being strongly promoted using the full range of marketing tools, with some branding and imagery being similar to that currently or previously used for conventional cigarettes

A wide range of marketing approaches are being used in the UK; at least some of the advertising and branding has resembled that previously used for cigarettes (20, 21) but this should no longer be permitted under new regulations by the Advertising Standards Authority.

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