

The role of e-cigarettes in treating tobacco dependence



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E-cigarettes have become increasingly popular in recent years. An estimated 3.2 million adults in Great Britain currently 'vape', up from 700,000 in 2012.¹

The main reason given by current vapers for using e-cigarettes is to help them stop smoking tobacco. The Smoking Toolkit Study estimates that in 2014 electronic cigarettes resulted in 20,000 more people quitting smoking who otherwise would not have done so.²

This statistic must be considered alongside the fact that smoking tobacco is one of the biggest preventable causes of premature death, disability, and health inequality in the UK and is a significant cause of hospital admissions.³ In 2015/16, an estimated 474,000 NHS hospital admissions in England were linked to smoking-related conditions. An estimated 16% (79,000) of all deaths in 2015 were attributed to smoking tobacco.⁴

The popularity of e-cigarettes across all social classes mean they may be important as a quit tool for disadvantaged groups, who are more likely to use tobacco and generally find it harder to quit. Once a user has purchased their starter kit the e-liquid costs approximately £3 for a 10ml vial of e-liquid which is cheaper than cigarettes.^{5,6}

Safety

But how safe are e-cigarettes? According to NICE e-cigarettes are substantially less harmful to health than smoking but are not risk free. Evidence about e-cigarettes is still developing, including the evidence on their long-term health impact.⁷

When discussing e-cigarettes with patients NICE says they should be advised that while nicotine inhaled from smoking tobacco is highly addictive, it is primarily the toxins and carcino-

gens in tobacco smoke – not the nicotine – that cause illness and death.⁸

In 1976 Professor Michael Russell (one of the developers of NHS evidence-based stop smoking services) wrote: "People smoke for nicotine, but they die from the tar."⁹

A review of the evidence commissioned by Public Health England (PHE) in 2014 found that the hazard associated with electronic cigarette products currently on the market "is likely to be extremely low, but certainly much lower than smoking".¹⁰ Other reviews have drawn similar conclusions with one putting the risks of vaping at less than 5% of the risks of smoking.²

Alongside publication of the review, PHE issued a statement in 2015 noting that while not risk free, electronic cigarettes carry a fraction of the risk of smoking cigarettes and have the potential to help smokers quit smoking.¹¹

NICE says smokers should be advised that if they want to use e-cigarettes to quit they should stop smoking tobacco completely, because any smoking is harmful.⁷

Current use of e-cigarettes by never smokers remains very rare and similar to use of licensed nicotine products with as little as 0.5% of the never smokers taking up vaping, which is similar to NRT. But use in never smokers needs continual monitoring.¹² The use of e-cigarettes among long-term ex-smokers appears to be increasing.¹³

Long term use of e-cigarettes will undoubtedly cause some harms in comparison to licensed NRT, and users should be encouraged to quit vaping too, though not at the expense of relapsing to smoking tobacco.¹⁴ A recent study showed that long-term e-cigarette users (who had been using their product for 17 months on average) had significantly lower levels of key



toxicants in their urine than those that still smoked – with levels in e-cigarette users similar to exclusive nicotine replacement therapy (NRT) users.¹⁵ Further research will provide the best data to answer questions concerning the safety and efficacy of e-cigarettes to support smoking cessation though such studies are time and resource intensive. Vaping should of course be avoided by non-smokers and e-cigarettes should not be sold to young people under the age of 18.¹⁶ E-cigarette uptake and regular use among children is also extremely low and there is currently no evidence to support concerns about a gateway effect to tobacco smoking.¹³ and use of e-cigarettes remains very low among young people (11-18 year olds) in Great Britain.¹⁷

Popcorn Lung (bronchiolitis obliterans)

Concerns around e-cigarettes causing the disease known as popcorn lung are not based on evidence, and the chemical (diacetyl) thought to be responsible for this disease has been banned from use in e-liquids in Europe.¹⁸

Effectiveness of e-cigarettes as stop smoking aid

Stop smoking interventions recommended by NICE are:

- Behavioural support (individual and group)
- Bupropion
- NRT – short and long acting
- Varenicline
- Very Brief Advice.⁵

NHS stop smoking data suggests that e-cigarettes, alongside behavioural support, are commonly and effectively used in combination with prescribed treatments.¹⁹

A recent study in the *NEJM* reported that e-cigarettes are almost twice as effective as NRT treatments at helping smokers to quit tobacco smoking. Led by Queen Mary University of London, and funded by the National Institute for Health Research and supported by Cancer Research UK, this study, a multi-centred randomised controlled trial is the first to test the efficacy of e-cigarettes in helping smokers to quit. It involved almost 900 smokers who also received additional behavioural support for up to four weeks.

The study reported that 18% of e-cigarette users were smoke-free after a year compared to 9.9% of participants who were using other NRT therapies, including patches, gum, lozenges, sprays, inhalators, or a combination of products.²⁰ Overall, throat or mouth irritation was reported more frequently

in the e-cigarette group compared with NRT with no increase in other respiratory adverse effects. Further focused studies are recommended.

The Smoking Toolkit Study is an ongoing national surveillance programme that involves surveys of nationally representative samples of adults in England every month. A study in 'addiction', surveyed a population comprised 18,929 who reported a quit attempt in the last 12 months.²¹

Use of e-cigarettes and varenicline are associated with higher abstinence rates following a quit attempt in England (OR=1.95, 95%CI:1.69-2.24), (OR=1.82, 95%CI:1.51-2.21). Higher abstinence rates were seen with use of prescription of nicotine replacement therapy but only in older smokers (OR=1.58, 95%CI:1.25-2.00) and interestingly use of websites only in smokers from lower socioeconomic status (OR=2.20, 95%CI:1.22-3.98).

Conclusion

PCRS believes that healthcare professionals should be prepared to help their patients to quit tobacco smoking and should be knowledgeable about e-cigarettes so they can answer questions if asked.

However a recent survey presented at the World Conference on Lung Cancer 2018, highlighted that English healthcare professionals are less likely to give advice to quit smoking than other leading tobacco control nations.²²

Of those clinicians that do raise the subject of smoking, only 6.2% mention e-cigarettes, and nearly two thirds either don't recommend them, or have no opinion on them.²³ In addition there are a lot of misconceptions among patients about e-cigarettes. Many smokers (44%) either believe that vaping is as harmful as smoking (22%) or don't know that vaping poses much lower risks to health than smoking (22%).²⁴

With the evidence we have to date on their efficacy and safety, it's appropriate that we are positive about e-cigarettes as an option to add to our existing array of evidence-based treatments and express an interest when a patient raises the subject.

Although these products are not licensed medicines, they are regulated by the Tobacco and Related Products Regulations 2016.

The BMA says that with appropriate regulation, e-cigarettes have the potential to make an important contribution towards achieving a tobacco-free society, leading to substantially reduced mortality from tobacco-related disease.²⁵

The PCRS position on e-cigarettes²⁶

Based on the current evidence PCRS supports e-cigarettes as a positive option available to support people to quit tobacco smoking.

- E-cigarettes are marketed as consumer products and are proving much more popular than NRT as a substitute and competitor for tobacco cigarettes.
- The hazard to health arising from long-term vapour inhalation from the e-cigarettes available today is unlikely to exceed 5% of the harm from smoking tobacco.
- The available evidence to date indicates that e-cigarettes are being used almost exclusively as safer alternatives to smoked tobacco, by confirmed smokers who are trying to reduce harm to themselves or others from smoking, or to quit smoking completely.
- The use of e-cigarettes as an option to help patients quit tobacco smoking is supported by Public Health England, the RCP and RCGP

PCRS guidance on treating tobacco dependence

PCRS believes that it is the responsibility of every healthcare professional to treat tobacco dependency systematically and effectively. The new PCRS pragmatic guide to treating tobacco dependence produced by a panel of experts, sets out a practical, evidence-based framework which enables healthcare professionals to routinely identify smokers then encourage and support them to quit.²⁷

Fact: Secondhand vape

'Vape clouds' exhaled from a patient's respiratory tract is not the same as smoke seen from combustible products like cigarettes, roll ups, water pipes, cigars etc. As the name suggests, 'vaping' is more like 'evaporation' where the components are heated (boiled) at temperatures far lower than combustible products. The liquid in the vaping device is heated to about 200 degrees Celsius versus 800 degrees Celsius for a cigarette.²⁸

References

1. Use of e-cigarettes (vapourisers) among adults in Great Britain. ASH. September 2018. <http://ash.org.uk/information-and-resources/fact-sheets/use-of-e-cigarettes-among-adults-in-great-britain-2018/>
2. <https://ash.org.uk/media-and-news/press-releases-media-and-news/ash-welcomes-new-public-health-england-report-e-cigarettes/>
3. Royal College of Physicians report. Hiding in plain sight: Treating tobacco dependency in the NHS. Published June 2018. Available at: <https://www.rcplondon.ac.uk/projects/outputs/hiding-plain-sight-treating-tobacco-dependency-nhs>
4. National Institute for Health and Care Excellence NG92. Stop smoking interventions and services. Published March 2018. <https://www.nice.org.uk/guidance/ng92>
5. Electronic cigarettes: A briefing for stop smoking services. 2016. National Centre for Smoking Cessation and Training (NCSCT). https://www.ncsct.co.uk/usr/pub/Electronic_cigarettes._A_briefing_for_stop_smoking_services.pdf
6. Kock, L., Shahab, L., West, R., and Brown, J. (2018) E-cigarette use in England 2014–17 as a function of socio-economic profile. *Addiction* 2019 Feb; 114(2):294–303. <https://www.ncbi.nlm.nih.gov/pubmed/30306714>
7. Stop smoking interventions and services. NICE March 2018. <https://www.nice.org.uk/guidance/ng92>
8. Public health guidance PH45. Tobacco: harm reduction approaches to smoking. NICE June 2013. <https://www.nice.org.uk/guidance/PH45>
9. Russell M. Low-tar medium-nicotine cigarettes: a new approach to safer smoking. *BMJ Journal* 1976; 1:1430–1433
10. Britton, J. and I. Bogdanovica, Electronic cigarettes: A report commissioned by Public Health England. London: Public Health England, 2014.
11. McNeill A et al. E-cigarettes: an evidence update. A report commissioned by Public Health England. PHE, 2015. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/733022/Ecigarettes_an_evidence_update_A_report_commissioned_by_Public_Health_England_FINAL.pdf
12. ASH (2018). Use of electronic cigarettes (vapourisers) among adults in Great Britain. <https://ash.org.uk/information-and-resources/fact-sheets/use-of-e-cigarettes-among-adults-in-great-britain-2018/>
13. Electronic cigarettes in England - latest trends <http://www.smokinginengland.info/latest-statistics/>
14. Shahab L, Goniewicz M, Blount B et al. Nicotine, carcinogen and toxicant exposure in long-term e-cigarette and nicotine replacement therapy users: a cross-sectional study. *Ann Intern Med*. 2017 Mar 21; 166(6): 390–400. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5362067/>
15. E-cigarettes non combustible inhaled tobacco products. RGGP position statement September 2017. <https://www.rcgp.org.uk/policy/rcgp-policy-areas/e-cigarettes-non-combustible-inhaled-tobacco-products.aspx>
16. ASH (2018). Use of electronic cigarettes (vapourisers) among children in Great Britain, <https://ash.org.uk/information-and-resources/fact-sheets/statistical/use-of-e-cigarettes-among-young-people-in-great-britain-2019/>
17. Bauld L, MacKintosh AM, Eastwood, B et al Young People's Use of E-Cigarettes across the United Kingdom: Findings from Five Surveys 2015–2017, *International Journal of Environmental Research and Public Health* 2017, Aug 29;14(9) <https://www.ncbi.nlm.nih.gov/pubmed/28850065>
18. Cancer Research UK. Does vaping cause popcorn lung? Available at <https://www.cancerresearchuk.org/about-cancer/causes-of-cancer/cancer-controversies/does-vaping-cause-popcorn-lung>
19. Table 4.5 NHS Digital <https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-nhs-stop-smoking-services-in-england/april-2018-to-september-2018#resources>
20. A Randomized Trial of E-Cigarettes versus Nicotine-Replacement Therapy. *N Engl J Med* 2019; 380:629–637 <https://www.nejm.org/doi/10.1056/NEJMoa1808779>
21. Smoking Toolkit Study – Resources <http://www.smokinginengland.info/sts-documents/>
22. E-cigarette summit, London. ASH, November 2018. <https://www.e-cigarette-summit.com/files/2018/11/9.30-Deborah-Arnott.pdf>
23. Gravely S, Thrasher JF, Cummings KM et al. Discussions between health professionals and smokers about nicotine vaping products: results from the 2016 ITC Four Country Smoking and Vaping Survey. *Addiction* 2018. <https://www.ncbi.nlm.nih.gov/pubmed/30548374>
24. PHE Health Harms campaign encourages smokers to quit. December 2018. <https://www.gov.uk/government/news/phe-health-harms-campaign-encourages-smokers-to-quit>
25. E-cigarettes. Balancing's risks and opportunities. BMA. 2017. <https://www.bma.org.uk/collective-voice/policy-and-research/public-and-population-health/tobacco/e-cigarettes>
26. E-cigarettes. PCRS position <https://www.pcrs-uk.org/resource/e-cigarettes-pcrs-position-PCRS-pragmatic-guide>
27. Diagnosis and Management of Tobacco Dependency. January 2019 <https://www.pcrs-uk.org/resource/tobacco-dependency-pragmatic-guide>
28. House of Commons Science and Technology Committee. Oral evidence. E-cigarettes. January 2018. <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee/ecigarettes/oral/76775.html>

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Commentary: Neil Jackson PCRS Lay Reference Group

Speaking from a patient angle, I am in support of the PCRS policy on e-cigarettes, and crucially, I believe it to be one of the best and most appropriately worded of its type. It contains everything necessary to address the concerns of the wider respiratory-interested community. Obviously I don't know what their questions are, and it may be helpful to know, but I would imagine they would be along the lines of "*should we be seen to be 'promoting' something that is still inherently a danger and 'as-yet-untested' in regards to its long-term effects?*".

I encounter this viewpoint/worry a fair bit in the patient communities that I am a part of, especially since there was talk in the news of 'fungal infections' and 'dirty water/condensate in vape equipment', and suchlike, and I have met with some quite rabidly-strong voices denouncing vaping as another evil that will one day return to bite us on the behind. It's possible there is some truth in that, at the moment, it's a question of proportional risk. Some detractors have even made unhelpful reference to the adverts of the early 20th Century where doctors were used in the promotion of cigarette brands, and attempted to portray current medical community 'backing' of vaping as being a repeat of the same.

All of it I must say I find rather 'hyper-reactive', flawed, unscientific, populist thinking, and largely missing the real point at hand - namely **the need to stop people smoking tobacco**. The way that the PCRS policy is worded makes it **quite clear** - and easily referenced. It makes clear that:-

- The PCRS stance is based on the vital, paramount need to help people cease smoking tobacco;
- it's a 'positive option', not a magic bullet solution;
- it's based on current evidence (the implication being that if evidence changed, so might our stance);
- the evidence shows majority of vapers are those seeking to quit tobacco (the implication being that few people are taking up vaping as a 'new vice' - which is another so far unfounded worry proposed by its detractors);
- and most-importantly, that PCRS accept there is scope for some risk, but compared to smoking tobacco, this risk is negligible and worth taking when considered responsibly and logically.

I think PCRS has done everything feasible to couch the policy in terms that make it clear that whilst this is not an entirely risk-free strategy, it's a logical, carefully-considered and sensible one, and is likely to massively reduce the numbers of tobacco smokers, save lives, money and healthcare resources. The alternative is to continue with already-tested strategies that are many orders of magnitude less successful, are just as risky (in different ways) and costly (perhaps more so). To persist in these old strategies makes no logical sense, if there is a markedly better alternative, even if it is not perfect.

Whether it was Einstein or Confucius who actually said it makes no difference, but it's true enough to say that "*repeating the same failing actions in the hope of receiving different results is the very definition of insanity.*" It very much applies here, I think.

E-Cigarettes are - for now at least - something that logic dictates should be fully supported. That does not rule out the opportunity for a future debate when tobacco-smoking is as alien to our culture as sending small children up chimneys to clean them, or making them work in matchstick factories and weaving mills. But we are not there yet, and the first task must be to eradicate tobacco-smoking as a top priority. Not at any cost, but at an appropriate, solidly and ongoingly researched one.

Neil Jackson, PCRS Lay Reference Group Member