

Background Paper regarding Smoking and Vaping at Work.

Vaping – Is it safe?

The answer is – we don't know for sure.

Public Health England have stated that vaping should be encouraged as a means to assist smokers to quit smoking tobacco products. They have stated that vaping is 95% less harmful to users than smoking. They have also stated that e-cigarettes have around 4% of the relative harm of cigarettes overall (including social harm) and 5% of the harm to users (see extract below). Therefore there is some perceived harm to both vapers and passive vapers, albeit at a much lower level than smoking or passive smoking.

The World Health Organisation have stated “The fact that ENDS (electronic nicotine delivery systems) exhaled aerosol contains on average lower levels of toxicants than the emissions from combusted tobacco does not mean that these levels are acceptable to involuntarily exposed bystanders. In fact, exhaled aerosol is likely to increase above background levels the risk of disease to bystanders, especially in the case of some ENDS that produce toxicant levels in the range of that produced by some cigarettes.” (see extract below).

Other research projects have linked chemicals in exhaled vaping aerosol with lung disease whilst other experts refuted the claims. Examples of this are also given below.

The NHS website states the following: “Many e-cigarette users may be asking themselves whether they should stop vaping. This study only provides indirect evidence of a risk linking chemicals in e-cigarettes to lung disease, but, if this is true, the consequences could be serious.

At present, there are more questions than answers. There's little doubt not smoking tobacco or e-cigarettes is the best way to reduce your risk.”

It is a fact that a minority of people, mostly those with pre-existing respiratory problems, find the exhaled aerosols of vaping to be a respiratory irritant. Some employees who responded to the survey confirmed that vaping vapours cause them respiratory irritation.

Conclusion

What is clear is that vaping is significantly safer than smoking and those that choose to vape as a means of quitting smoking should be encouraged to do so. However this does not mean that the majority of staff, who have expressed their preference not to be exposed to vaping products should have their views ignored. Indeed, if in the future it is proven that there is a risk to health from the inhalation of vaping chemicals, the Council may be considered to have been in breach of its statutory duty to the health and safety of employees for deciding to allow the exposure of employees to vaping chemicals in the workplace despite the information readily available from reputable organisations such as the World Health Organisation, Public Health England and the NHS.

The proposed changes to the smoking and vaping policy have acknowledged the benefits to smokers of switching to vaping by permitting vaping in the shelter of the underground car park at the Civic Offices and in any reasonable area away from doors and windows in the grounds of all Council premises.

The proposal **not** to permit vaping in offices and enclosed workplaces acknowledges the preference of the majority of staff who responded to the survey, protects those who are affected by vaping vapours from exposure at work and ensures the Council fulfils its obligation to protect, so far as is reasonably practicable, the health, safety and welfare of its employees.

Sources of quoted information

Extracts from World Health Organisation Report FCTC/COP/6/10 'Electronic nicotine delivery systems' dated 21/07/14

28. Potential interference with smoke-free policies.

(a) Smoke-free policies are designed not only to protect non-smokers from second-hand smoke, but also to provide incentives to quit smoking and to denormalize smoking as adolescents are particularly vulnerable to visual cues and social norms.

(b) The use of ENDS in places where smoking is not allowed

(i) increases the exposure to exhaled aerosol toxicants of potential harm to bystanders,

(ii) reduces quitting incentives, and

(iii) may conflict with the smoking denormalizing effect.

(c) Many ENDS look like smoking products and even if they do not resemble them, the exhaled vapour looks like tobacco smoke. ENDS are marketed to be used where smoking is prohibited and given the resemblance to tobacco products it is likely that their use where smoking is banned will make enforcing smoke-free policies more difficult.

(d) The fact that ENDS exhaled aerosol contains on average lower levels of toxicants than the emissions from combusted tobacco does not mean that these levels are acceptable to involuntarily exposed bystanders. In fact, exhaled aerosol is likely to increase above background levels the risk of disease to bystanders, especially in the case of some ENDS that produce toxicant levels in the range of that produced by some cigarettes.

41. Use of ENDS in public places.

Since the reasonable expectation of bystanders is not a diminished risk in comparison to exposure to second-hand smoke but no risk increase from any product in the air they breathe, ENDS users should be legally requested not to use ENDS indoors, especially where smoking is banned until exhaled vapour is proven to be not harmful to bystanders and reasonable evidence exists that smoke-free policy enforcement is not undermined. If smoke-free legislation is not fully developed according to Article 8 of the WHO FCTC and the guidelines for its implementation, this should be done as soon as possible.

49. Health warnings.

ENDS health warnings should be commensurate with proven health risks. In this regard, the following risk warnings could be considered: potential nicotine addiction; potential respiratory, eyes, nose and throat irritant effect; potential adverse effect on pregnancy (due to nicotine exposure).

Extracts from 'e-cigarettes: an evidence update' Published by Public Health England, August 2015

Extract from the Executive Summary:

Acknowledging that the evidence base on overall and relative risks of EC in comparison with smoking was still developing, experts recently identified them as having around 4% of the relative harm of cigarettes overall (including social harm) and 5% of the harm to users.

Extract from Summary of Chapter 10: Safety of e-cigarettes in light of new evidence

A high level of formaldehyde was found when e-liquid was over-heated to levels unpalatable to EC users, but there is no indication that EC users are exposed to dangerous levels of aldehydes;

Extract from Chapter 10: Safety of e-cigarettes in light of new evidence

Two recent reports raised a possibility that under certain conditions, EC may release high levels of aldehydes. Aldehydes, including formaldehyde, acrolein and acetaldehyde, are released in tobacco

smoke and contribute to its toxicity. Aldehydes are also released with thermal degradation of propylene glycol and glycerol in e-liquids. Previous studies detected the presence of aldehydes, especially formaldehyde, in the vapour from some EC, but at levels much lower than in cigarette smoke [138]. Across brands, EC released 1/50th of the level of formaldehyde released by cigarettes. The highest level detected was six times lower than the level in cigarette smoke [138].

Extract from Chapter 10: Safety of e-cigarettes in light of new evidence, Summary of findings

None of the studies reviewed above alter the conclusion of Professor Britton's 2014 review for PHE. While vaping may not be 100% safe, most of the chemicals causing smoking-related disease are absent and the chemicals that are present pose limited danger. It had previously been estimated that EC are around 95% safer than smoking [10, 146]. This appears to remain a reasonable estimate.

Flavoring Chemicals in E-Cigarettes: Diacetyl, 2,3-Pentanedione, and Acetoin in a Sample of 51 Products, Including Fruit-, Candy-, and Cocktail-Flavored E-Cigarettes Research article published in *Environ Health Perspect*; DOI:10.1289/ehp.1510185

Abstract of article

Background: There are over 7,000 e-cigarette flavors currently marketed. Flavoring chemicals gained notoriety in the early 2000's when inhalation exposure of the flavoring chemical diacetyl was found to be associated with a disease that became known as "Popcorn Lung." There has been limited research on flavoring chemicals in e-cigarettes.

Objective: To determine if the flavoring chemical diacetyl, and two other high-priority flavoring chemicals 2,3-pentanedione, and acetoin, are present in a convenience sample of flavored e-cigarettes.

Methods: We selected 51 types of flavored e-cigarettes sold by leading e-cigarette brands and flavors we deemed were appealing to youth. E-cigarette contents were fully discharged and the air stream was captured and analyzed for total mass of diacetyl, 2,3-pentanedione, and acetoin, according to OSHA Method 1012.

Results: At least one flavoring chemical was detected in 47 of 51 unique flavors tested. Diacetyl was detected above the laboratory limit of detection 39 of the 51 flavors tested, ranging from < limit of qualification (LOQ) to 239 µg/e-cigarette. 2,3-pentanedione and acetoin were detected in 23 and 46 of the 51 flavors tested at concentrations up to 64 and 529 µg/e-cigarette, respectively.

Conclusion: Due to the associations between diacetyl, bronchiolitis obliterans and other severe respiratory diseases observed in workers, urgent action is recommended to further evaluate this potentially widespread exposure via flavored e-cigarettes.

Flavouring found in e-cigarettes linked to 'popcorn lung'

Extract from NHS website published Tuesday December 8 2015

(<http://www.nhs.uk/news/2015/12December/Pages/Flavouring-found-in-e-cigarettes-linked-to-popcorn-lung.aspx>)

Conclusion

This study shows three chemicals reportedly linked to serious lung damage are present in many flavoured e-cigarettes in the US, raising concerns about their safety.

Although the study tested US brands, it is likely similar findings would be found here in the UK, where e-cigarettes are similarly unregulated.

However, this issue is not black and white. The researchers' concerns have been rightly raised, and their conclusion that urgent research needs to follow this study seems logical given the apparent lack of knowledge in this area.

Still, much of the potential health risk and alarm factor of this study hangs on the strength of previous reports suggesting these chemicals can cause lung damage.

But this particular study did not address this directly. We do not yet know whether these chemicals, in their vaporised forms and inhaled at the levels typical in e-cigarettes, cause any lung damage.

This study simply looked at how often the three chemicals were detected in e-cigarettes, assuming a link with potential lung damage from other studies that were not appraised here.

What we really need is more information on the potential causal link between these chemicals and lung disease, particularly the doses at which any damage might occur, which may or may not be present in e-cigs.

Many e-cigarette users may be asking themselves whether they should stop vaping. This study only provides indirect evidence of a risk linking chemicals in e-cigarettes to lung disease, but, if this is true, the consequences could be serious.

At present, there are more questions than answers. There is little doubt not smoking tobacco or e-cigarettes is the best way to reduce your risk.