

Advice on actions for suspected ingestion of nicotine e-cigarette vaping liquid

This brief information is to support staff delivering care in health and justice settings. As re-chargeable e-cigarettes are being made available for purchase by prisoners, this briefing provides some background information about these devices and also how to manage cases of suspected ingestion of the vaping liquid.

ALERT BOX

All patients who have taken a deliberate overdose or who have ingested 0.2 mg/kg or more nicotine, or those who are symptomatic, should be referred for medical assessment.

Emergency transfer to hospital is needed if signs and symptoms of toxicity are present or develop.

People aged 13 and over or adults who have accidentally ingested less than 0.2 mg/kg nicotine and who have no new symptoms since the time of ingestion do not need to be referred for medical assessment. Patients should be advised to seek medical attention if symptoms develop.

Signs and Symptoms for nicotine toxicity

Early features of ingestion include burning in the mouth and throat, nausea, vomiting, confusion, dizziness, weakness, hypersalivation, sweating and increased bronchial secretions. There may be sympathetic features including tachycardia, tachypnoea, hypertension and agitation followed by bradycardia, systemic hypotension and respiratory depression. More severe poisoning can lead to arrhythmias including atrial fibrillation, coma, convulsions and respiratory and cardiac arrest.

Skin contact may lead to irritation with a level of absorption dependent on the length of exposure and concentration. Systemic features may follow.

Refills can be mistaken for **eye drops** and administered accidentally. Eye contact with liquid may lead to irritation and lacrimation

Actions to take if systemic toxicity suspected or present

Ingestion:

- Maintain a clear airway and ensure adequate ventilation
- In the event of cardiac arrest commence CPR and call an ambulance

Skin Exposure:

- Remove soiled clothing and any nicotine patches. Thoroughly wash contaminated skin with soap and water. If features of systemic toxicity are present, manage as per ingestion above

Eye Exposure:

- Gently bathe eye(s) with water, to remove any residue, and seek advice in case of significant irritation
- If features of systemic toxicity are present, manage as per ingestion

Advice for treating pregnant women

Treatment of the pregnant patient should be the same as for the non-pregnant patient. Following nicotine poisoning in a pregnant patient, maternal toxicity is likely to be a major determinant of foetal risk. Where treatment of maternal symptoms is clinically indicated, this should not be withheld on account of pregnancy.

Due to a lack of data concerning how nicotine poisoning can affect the foetus, it is not currently possible to predict the nature or likelihood of adverse events occurring in the developing foetus. In all cases of nicotine poisoning in pregnancy, enhanced maternal and foetal monitoring may be warranted. Discussion with UK Teratology Information Service (UKTIS) is recommended in all cases.

E-cigarettes and vaping devices - Background on products and toxicity

E-cigarettes and vaping devices (EC) use battery power to heat an element to disperse a solution that usually contains nicotine. The dispersion of the solution leads to the creation of an aerosol that can be inhaled by the user. The heated solution typically contains propylene glycol or glycerine, nicotine, and flavourings. EC do not contain tobacco, do not create smoke and do not rely on combustion. EC products available in prison contain a maximum of 20mg/ml of nicotine. Vaping products not compliant with UK regulation have been known to contain up to 100 mg/mL so the toxicity risk is significantly increased.

The information about products available at 1st December 2017 for purchase in HM prisons is shown in the HMPPS factsheet in Appendix 1.

Fatal poisoning from nicotine is extremely rare but with the increase in EC use, there has been an increase in calls to poison centres following accidental exposures. These remain lower than calls following such exposure from tobacco and none resulted in any serious harm (PHE 2015). Serious nicotine poisoning seems normally prevented by the fact that relatively low doses of nicotine cause nausea and vomiting, which stops users from further intake.

Evidence exists that suggests that nicotine is highly toxic by ingestion, inhalation and skin contact, although the fatal dose in adults is not clear from published evidence (Baselt, 2008; Lavoie and Harris, 1991, PHE 2015). Nicotine can be very rapidly absorbed with CNS, neuromuscular and autonomic features. Symptoms may persist for up to 72 hours in severe cases of poisoning (Davies et al, 2001). The half-life of nicotine ranges from 24 minutes to 2 hours (Feyerabend et al, 1985; Baselt, 2008).

References

Public Health England (PHE) 2015: E-cigarettes – an evidence update: A report commissioned by Public Health England ([link](#))

Public Health England 2017 submission to the House of Commons Science and Technology Committee for up to date TOXBASE and NPIS data on enquiries relating to e-cigarettes.([link](#))

Baselt RC. Disposition of toxic drugs and chemicals in man. 8th Ed. Biomedical Publications: Foster City, California, 2008. p 744-748.

Lavoie FW, Harris TM. Fatal nicotine ingestion. J Emerg Med 1991; 9: 133-136. [Click here for abstract](#)

Feyerabend C, Ings RMJ, Russell MAH. Nicotine pharmacokinetics and its application to intake from smoking. Br J Clin Pharmacol 1985; 19: 239-247.

TOXBASE <https://www.toxbase.org/> : Nicotine toxicity information accessed 24th November 2017.