

## **Risks of Vaping in Children and Young People: a Guide for Parents and Guardians**

### **Summary**

The prevalence of vaping in children and young people in Great Britain, is [increasing rapidly](#). Short term studies suggest that vaping is substantially less toxic to users than the harmful effects known to be caused by use of tobacco products. Nicotine is the main addictive substance in cigarettes and other forms of tobacco. E-cigarettes (vapes) were intended to provide controllable exposure to nicotine without the harmful substances present in tobacco smoke as an aid to reducing or stopping smoking. However, vaping is not without its risks. An earlier [infographic](#) statement summarises the differences in composition between cigarettes and vapes. The long-term health effects of vaping are yet to be established due to the lack of toxicity data on the additive components in vape liquid and the subsequent aerosol which is breathed into the lungs. Health advice is clear. [Non-smokers and young people under 18 should not take up vaping](#). Children and young adults require protection from the illegal sales of vapes and illicit vaping products, many of which contain very high concentrations of nicotine as well as unknown amounts of potentially harmful substances. The UK Government has announced in January 2024 a number of new legislative measures aimed at protecting young people from the harms of vaping.

### **Background**

E-cigarettes or ‘vapes’ are electronic devices that heat a liquid, which produces an aerosol, or mixture of small particles. Nicotine is present in tobacco smoke and is the main addictive component. Nicotine is also the sole active ingredient in vape liquids, intended to control withdrawal symptoms in someone trying to reduce or stop smoking.

Overall, in Great Britain (GB), 4.7 million adults regularly vape each year (data from 2022 survey by Office of National Statistics), with [users purchasing half a billion vapes annually](#).

Recent reports indicate that there has been a dramatic increase in the prevalence of vaping amongst children and young people in GB. During March/April 2023 the number of children and adolescents experimenting, or regularly using vapes had increased by 50% from the previous year. To date, [one in nine children, compared to one in thirteen in 2021/22](#), have indicated that they have experimented with a vaping product. Existing legislation states that it is an offence to sell vapes, disposable vapes or liquid containing nicotine to children under 18 years of age in the United Kingdom (UK). Despite these restrictive measures, a study across Wales in 2022-23 showed that [67 of 297 attempts \(23%\) by volunteers under the legal age to purchase nicotine containing vapes, resulted in a sale](#). Disposable vapes are increasingly used by children and young adults since they are generally cheaper to purchase and are more attractive and discrete, which is advantageous for some users. Research has shown that in 2023 [69% of vapers aged 11 to 17 years-old used disposable vapes, up from 7.7% in 2021](#).

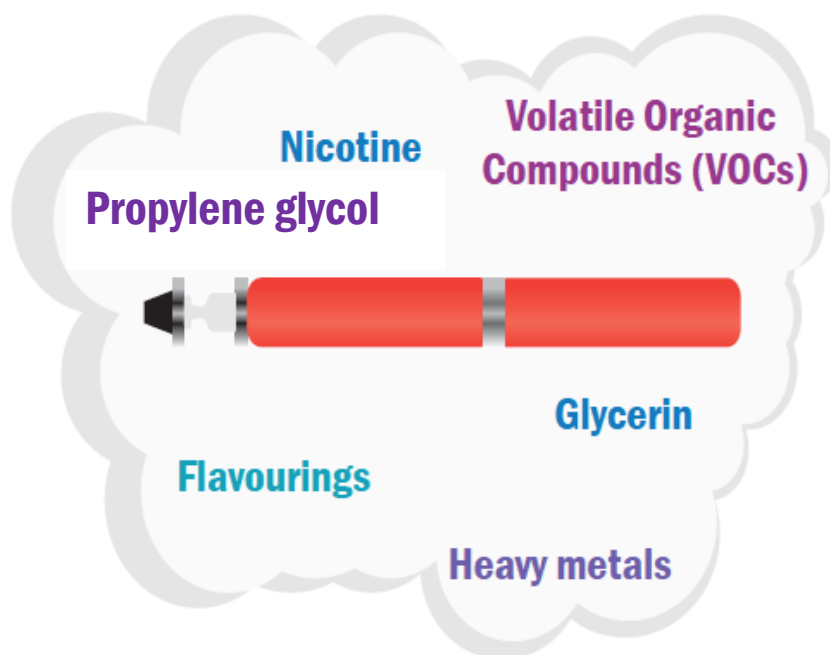
The main reasons given by children and young people for using vapes included eagerness to ‘join in’ with their peers to ‘give it a try’, and an enjoyment of product use, mainly due to the accessibility to

a variety of likeable flavours such as fruit, or sweet or soft drinks. [As a result](#), 20.5% of children in GB admitted having ‘used’ a vaping product during 2023, a rise from 15.8% in 2022 and 13.9% in 2020.

### **Are vapes safer than cigarettes?**

Electronic cigarettes were originally designed to help relieve and/or prevent cravings and other nicotine withdrawal symptoms in smokers who wish to quit or cut down on their smoking habit. They are believed to be less harmful than traditional tobacco cigarettes since vape aerosol contains lower levels of [the many toxicants found in tobacco smoke](#); however, there are no long-term data on their safety in humans. Health advice is clear. [Non-smokers and young people under 18 should not take up vaping](#). Moreover, e-cigarette designs have evolved considerably since their introduction to the UK market. Current products are designed to be much more appealing to users, particularly young people; discrete, disposable cartridges, wrapped in bright, attractive packaging, and pleasant vaping flavours have escalated their popularity. Of concern, there is [growing evidence](#) that e-cigarette use by adolescents and young adults is associated with greater risk of subsequent initiation of cigarette smoking. The UK Government, convinced by [the clear evidence that vapes should not be used by or targeted at children](#), is to introduce new legislative controls (see later).

### **What do ‘vapes’ contain?**



**Figure from BTS infographic Statement** [E-cigarettes and Vaping](#)

#### Nicotine

Nicotine is the only active ingredient in vapes. Nicotine is an extremely addictive agent and can produce other harmful effects when inhaled in high concentrations and/or used repeatedly.

Nicotine can be present in high concentrations in some vapes (up to the legal limit of 20 mg/mL in regulated products, or much higher in illegal vapes). It usually produces a stimulant effect but can lead to a depressant effect following high doses. Within seconds of taking a ‘puff’ from a nicotine containing device, the nicotine reaches the brain and causes the release of mood and behaviour altering chemicals. Adverse effects on the nervous system include dizziness, confusion, agitation and

seizures. Of concern, [nicotine use can harm the development of the adolescent brain](#) (the brain continues to development until the age of 25) and can lead to long term consequences by modifying areas of the brain that control attention, learning and mood.

[When a nicotine dependent individual stops using the drug, they can develop nicotine withdrawal symptoms](#) such as irritability, restlessness, feeling anxious or depressed, trouble sleeping, poor concentration, and nicotine cravings. Consequently, [children and young people often return to their vaping habit in an attempt to deal with the additional stress or anxiety](#), essentially creating a sequence of nicotine dependence. The nicotine in e-cigarettes, as with other tobacco products, can also [prime the adolescent brain for addiction to other drugs such as cocaine](#).

Although nicotine largely affects the brain it can also adversely affect the heart and the respiratory and gastrointestinal systems. Symptoms include increased heart rate and blood pressure, bronchospasm (abnormal tightening of airways), increased phlegm (mucous secretion), persistent cough and vomiting or diarrhoea.

[The legal limit of nicotine-containing liquid presented for retail sale in an e-cigarette or refill container is 20 mg/mL in the UK](#). Despite this, many illegal vapes have been found to contain excessive levels of nicotine with packaging labels displaying inaccurate nicotine concentrations [leading to prosecutions](#). Furthermore, [some marketed 'zero percent nicotine' vapes, have been found to contain nicotine](#).

### **Additional harmful ingredients**

#### Heavy metals

The aerosol that users breathe from devices and exhale can contain other, potentially harmful substances, in addition to the nicotine. The presence of heavy metals (e.g. lead, nickel, tin and chromium) has been detected in the heating elements of vape devices. [Studies relating to heavy metals in vape liquids and aerosols](#) have demonstrated that there may be an increased health risk of developing cancer and other illnesses following exposure to these carcinogens.

#### Flavourings (aldehydes)

Ultrafine particles contained in the aerosol flavourings (aldehydes) can be inhaled deep into the lungs, causing respiratory irritation and subsequent long term lung function injury. Flavourings such as [diacetyl, acetyl propionyl and acetoin](#), are chemicals which are known to cause lung diseases.

#### Volatile organic compounds

Acrylamide, benzene, and propylene oxide are classified as volatile organic compounds. They are known or suspected human carcinogens and can pose a health risk to users.

#### Solvent carriers

Solvent carriers such as [propylene glycol and glycerol](#) can cause mouth and lung irritation. Long term health effects of propylene glycol and glycerol in humans are not known.

Additionally, some young vapers are able to modify their devices allowing them to vape cannabis-based oils and other cannabinoid and opioid based agents.

### Spiking of Vapes

Spiking, the covert addition of other harmful drugs to vapes, is a dangerous trend that seems to be increasing. There have been press and police reports of vapes spiked with spice, the street name for synthetic cannabinoids which can cause serious adverse effects such as chest pains, seizures, extreme anxiety and suicidal thoughts, being offered to school children.

### **Environmental impact**

It was [estimated in September 2023](#) that the number of disposable single-use vapes thrown away in the UK had quadrupled in the preceding year to 5 million per week.

Disposable vapes are powered by lithium-ion batteries, furthermore, many of the other components used to make vaping devices are challenging to recycle, resulting in further concerns for the environment.

### **Other dangers**

Defective e-cigarette batteries have caused fires and explosions, which have resulted in serious injuries to the public. Children and young adults have also been poisoned by accidentally swallowing, breathing, or absorbing e-cigarette liquid through their skin or eyes. [Some bottles of e-liquid, used for replenishing vaping reservoirs have also been incorrectly used as eyedrop solutions](#) due to their similarities with other pharmaceutical drops.

### **Forthcoming changes in legislative control of vaping by children in the UK**

Following public consultation, [the UK Government announced in January 2024](#) new legislative measures to further restrict the sale of tobacco to children and to control youth vaping. The Government acknowledged that the evidence is clear that vapes should not be used by, or targeted at, children – due to the risk of known and unknown harms. They were also concerned about the serious environmental impact of disposable vapes.

The ensuing draft Tobacco and Vapes Bill rapidly passed through the various stages of approval in Parliament with broad support across political parties.

Alongside the plan to ensure that children up to those who turn 15 in 2024 can never legally be sold cigarettes, [the following measures to control youth vaping are included in the Tobacco and Vapes Bill](#) (with some differences between England, Wales, Scotland and N Ireland in their application):

- It will be an offence to sell non-nicotine vaping products to under 18s.
- Disposable vapes will be banned.
- The Secretary of State will have the power to make regulations restricting the retail packaging, contents and flavouring of vaping and nicotine products and restricting the display of vaping products in retail outlets.
- It will be an offence to distribute free vaping products to under-18s.
- Enforcement authorities will have new powers to issue on-the-spot fines for selling vaping products to under-18s, distributing free vaping products to under 18s and to anyone purchasing vaping products for someone underage.

The Tobacco and Vapes Bill was anticipated to be enacted before the general election but, when this was announced, there was insufficient time to complete its passage and gain Royal assent. The major parties are expected to [commit to reviving the bill](#) in the next Parliament.