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Vaping

10 frequently asked questions

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GPs may be asked by their patients for advice on vaping and therefore need to be informed with the latest evidence. GPs may also wish to recommend personal vaporisers to patients unable or unwilling to quit smoking with conventional therapies. This article provides evidence-based answers to 10 of the most frequently asked questions about vaping with the aim of providing GPs with the information they need to confidently discuss the subject with their patients who smoke.

An estimated 240,000 people in Australia currently use personal vaporisers (or electronic cigarettes), mostly as a less harmful alternative to smoking or as an aid to help them quit.¹ However, the use of vaporisers – known as ‘vaping’ – has generated considerable debate. Supporters argue that vaping could save the lives of millions of smokers, whereas others contend that vaping may entice young people to start smoking and undermine tobacco control.^{2,3} It is, therefore, no surprise that the public is confused about vaping and that the level of misperceptions is increasing.⁴ This article aims to provide GPs with the practical information they need to discuss electronic cigarettes with their patients.

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Australian health departments and most health and medical organisations including the NHMRC are currently taking a precautionary, risk-averse stance on vaping, arguing that more research is needed. The main public health concerns raised about vaping are not discussed in this article but are listed in Box 1.

Vaporisers are battery-operated devices that heat a liquid solution (‘e-liquid’) that may or may not contain nicotine into a vapour that the user inhales. Vaping simulates tobacco smoking and can satisfy the behavioural (hand-to-mouth), sensory (‘throat hit’ and taste) and social aspects of the smoking ritual.

1. Does vaping help people to quit smoking?

There is growing scientific evidence that vaping helps some people to quit smoking. Personal vaporisers are now the most popular quitting aid in many countries including the UK and US.^{5,6}

The best evidence for effectiveness comes from real-world population studies that have demonstrated high quit rates compared with other methods, especially with daily use.^{7,8} In the European Union alone, more than six million smokers reported quitting with the use of vaping and a further 1.5 million have quit using vaping in the UK.^{9,10}

The limited randomised clinical trials conducted so far have found that the older devices are at least as effective as the nicotine patch in smoking cessation, although the evidence is weak.¹¹ The newer devices deliver nicotine more effectively and have higher quit rates.¹² Figure 1 illustrates the evolution of vaping devices.

2. How safe is vaping?

Vaping is not risk-free. However, the scientific consensus is that it is far less harmful than smoking. The UK Royal College of Physicians and Public Health England have reviewed the evidence and concluded that the long-term risk of vaping is unlikely to exceed 5% of the harm from smoking tobacco.^{13,14} A recent study estimated the cancer risk from vaping as less than 0.5% of that from smoking.¹⁵ Box 2 provides the evidence for the respiratory effects of vaping.¹⁶⁻²⁷

The harmful effects of smoking are almost entirely due to the tar, carbon monoxide and other toxic chemicals produced by burning tobacco. The vast majority of these toxins are absent from vapour or are only present at trace levels.²⁸ As regular vaping is almost exclusively confined to smokers and ex-smokers, any risk should be compared

Key points

- **Electronic cigarettes are a legitimate tobacco harm reduction tool for smokers who are unable or unwilling to quit unaided or with approved therapies.**
- **There is growing evidence that vaping helps some people to quit smoking.**
- **Electronic cigarettes are not risk free but are far less harmful than smoking.**
- **Regular use by young people and nonsmokers is rare.**

with the considerable risks of continuing to smoke tobacco.^{10,13} Risk can be further decreased by encouraging users to eventually stop vaping if they can do so without relapsing to smoking.

There have been rare reported cases of vaporisers causing fires; however, the risk appears to be comparable with similar electrical goods.¹⁴ This risk may be reduced by purchasing quality devices and following safe charging and handling guidelines.

Electronic cigarettes are not currently regulated in Australia, raising uncertainties about safety, quality and labelling accuracy.

3. What are the long-term risks?

Like all new products, the long-term health effects of vaping are yet to be established. However, based on current knowledge of the ingredients of vapour, long-term use is likely to be much less harmful than smoking, which prematurely kills up to two in three long-term users.^{13,14}

Studies of up to 12 months duration have demonstrated that vaping leads to substantially reduced levels of carcinogens and other toxins in the saliva and blood of users (biomarkers) compared with smoking.²⁹ Studies of up to three and a half years and 10 years of real-world experience have not detected any serious harm to health.^{13,23}

4. Is nicotine dangerous?

Although nicotine is the main chemical that smokers are addicted to, it has relatively minor health effects in the low concentrations used in vaping (except in pregnancy). Adverse effects of nicotine include transient rises in pulse rate and blood pressure, delayed wound healing and effects on glucose metabolism.¹³ There is no evidence that nicotine causes cancer or lung disease and it plays a minor role in causing cardiovascular disease.³⁰ There is also no evidence in humans that nicotine is harmful to the adolescent brain.³⁰

Nicotine has some positive effects such as enhancing cognition, concentration and memory and assisting with weight control.¹³ It also benefits some medical conditions such as schizophrenia, Parkinson's disease and ulcerative colitis.³⁰

Most cases of intentional or accidental poisoning involving nicotine e-liquid result in prompt vomiting and rarely cause serious harm.

1. Concerns raised about vaping

- Vaping may entice young people to take up smoking (gateway effect).
- Widespread use may increase the social acceptability of smoking (renormalisation).
- Some smokers may continue to vape and smoke and be less likely to quit (dual use).
- The evidence that vaping helps smokers quit is not conclusive.
- There is evidence of direct harms from vaping.
- The precise long-term effects are not yet known and more research is needed.
- Vaping is a 'Big Tobacco' plot to keep people smoking, hook youth or undermine tobacco control.

Rare deaths have occurred in toddlers, hence nicotine should always be stored in childproof containers out of reach of children.

5. Is second-hand vapour harmful?

There is no evidence that exposure to second-hand vapour is harmful to bystanders.^{13,14} Traces of toxic chemicals are present in the exhaled mist, but at such low levels that they are unlikely to be harmful to health. Also, vapour dissipates very quickly, unlike smoke, which persists in the air for long periods. Nevertheless, it is still prudent to

2. Respiratory effects of vaping¹⁶⁻²⁷

Cell studies

- Some studies have found impaired cell viability after exposure, some have not.¹⁶

Animal studies

- Adolescent mice exposed to vapour for eight weeks had reduced lung function.¹⁷
- Other studies have found impaired immune defences, increased inflammatory markers, oxidative stress and airways hyper-responsiveness.¹⁶

Human studies

- Smokers who switch to vaping had improved lung function and respiratory symptoms;¹⁸ improved asthma control, spirometry and airways hyper-responsiveness at 12 months;¹⁹ improved respiratory health markers (FeNO and eCO);²⁰ improved COPD with reduced exacerbations, improved symptoms, reduced decline in FEV₁ at 24 months;²¹ reduced self-reported respiratory infections.²²
- A study of never-smoking vapers found no subjective or objective respiratory changes over 3.5 years.²³
- In large adolescent studies, increased cough and phlegm was found in vapers;²⁴ an increased incidence of asthma in vapers and increased school absenteeism because of asthma was also reported.²⁵
- No difference in airflow after vaping was found;²⁶ a single vaping session in smokers was reported to have mechanical and inflammatory effects, especially in mild asthma.²⁷

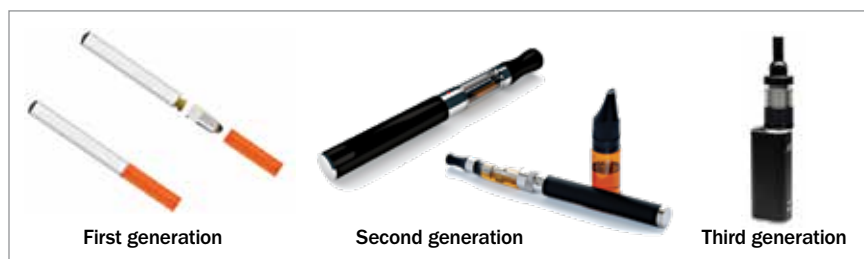


Figure 1. The evolution of vaping devices.

avoid vaping around vulnerable people, such as children, pregnant women or people with cardiovascular disease.

6. Don't most people who vape also continue smoking?

Although some smokers quit very soon after their first experience with a vaporiser, many go through a transition stage of both smoking and vaping (dual use) before finally quitting smoking permanently. This pattern of dual use is just as common as when smokers use nicotine replacement therapy to quit.⁵

Most studies have found that dual users maintain their nicotine level but significantly reduce the number of cigarettes they smoke each day, thereby lowering their exposure to toxins.³¹ However, quitting tobacco altogether is always the preferred goal.

7. Is vaping a gateway to smoking for young people?

Overseas experience suggests that vaping is replacing, rather than encouraging, smoking of tobacco cigarettes among young people (under 18 years of age).¹³ Smoking rates in youth are continuing to fall where vaping is readily available.³²

Vaping in young people is associated with trying tobacco cigarettes later in life.³³ However, there is no evidence that vaping causes young people who would not have otherwise smoked to take up smoking. A more likely explanation is 'common liability' – that is, that young people who are more attracted to experimentation are predisposed to trying both products.³⁴

Most vaping by young people is experimental, infrequent and short-lived. Regular vaping by nonsmoking adolescents is rare.³⁵ Furthermore, most young people who experiment with vaping use flavoured e-liquids without nicotine.³²

8. Won't vaping just 're-normalise' smoking'?

There is no evidence that the increased visibility of vaping is causing smoking to become socially acceptable again.^{13,14} Most vaporisers now look very different to tobacco cigarettes and do not smell of smoke. Research suggests that they are unlikely to entice nonsmokers to take up smoking.³⁶

There is also no evidence that they are undermining the decline in cigarette smoking rates among adults and youth. On the contrary, the evidence suggests they have contributed to an accelerating rate of decline in smoking since 2010 in countries where vaping is readily available and widely used, such as in the US.³⁷

9. Is vaping legal in Australia?

Nicotine e-liquid can be used legally to quit or reduce smoking if the user has a nicotine prescription from a registered medical practitioner.³⁸ GPs may be asked to write such a prescription. Otherwise, nicotine for vaping is classified as a schedule 7 dangerous poison in the national Poisons Standard. It is an offence to possess or use it in all states and territories without an authority.³⁸

It is legal to possess electronic cigarette devices and to vape with nicotine-free e-liquids, although there are restrictions imposed by some states on where vaping is permitted.

Vaping is not currently endorsed by the NHMRC or TGA. Whether electronic cigarettes are clinical interventions requiring strict regulatory approval or consumer devices is being debated.

10. Where can I get more information?

The Australian Tobacco Harm Reduction Association (ATHRA) is a not-for-profit

health promotion charity established to improve public health by raising awareness of reduced-risk alternatives to smoking and educating the public and health professionals. The ATHRA website (www.athra.org.au) has detailed information for smokers on how to switch to vaping and a section for health professionals, including how to write a nicotine prescription.

The ATHRA board of directors comprises four independent medical practitioners with an interest in public health and one consumer representative. None of the directors has any financial or commercial relationship with any electronic cigarette or tobacco company.

Conclusion

Smokers who are unable or unwilling to quit with conventional cessation aids may benefit from trialling an electronic cigarette as a substitute for smoking or as a quitting aid. There is mounting evidence that vaping is less harmful than smoking, although the long-term risks are not yet fully established. GPs asked by patients about these products should discuss the pros and cons with them. If patients wish to go ahead and try them, GPs can provide behavioural support and a prescription to enable legal use of nicotine e-liquid. **RMT**

Further reading

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A list of references is included in the website version of this article (www.respiratorymedicinetoday.com.au).

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