Electronic cigarettes (e-cigarettes, also known as electronic nicotine delivery systems, electronic non-nicotine delivery systems, or ‘ENDS’) have recently gained prominence in Australia and around the world, and are marketed online as a method to assist smokers to quit, or a ‘safe alternative’ to conventional tobacco cigarettes. However, there is currently insufficient evidence to support these claims and further research is needed to enable the safety, quality and efficacy of e-cigarettes to be assessed.

E-cigarettes are battery operated devices that heat a liquid (called ‘e-liquid’ or ‘e-juice’) to produce a vapour that users inhale. Although the composition of this liquid varies, it typically contains a range of chemicals, including solvents and flavouring agents, and may or may not contain nicotine.

The potential risks and benefits of e-cigarettes are currently the subject of much debate among tobacco control and public health experts. Some argue that e-cigarettes have the potential to reduce the number of smoking-related diseases and deaths, by assisting smokers to quit, or by providing a safer alternative to tobacco cigarettes. This is based on the widely-held belief that e-cigarettes are likely to be less harmful than tobacco cigarettes, because they expose users to fewer toxic chemicals.\(^1\) There is some preliminary evidence that supports this view.\(^2,3\)

However, some experts have raised concerns that e-cigarettes are promoted as a safer option for smokers, when their long term health effects are unknown. They are also concerned that the potential benefits to smokers are outweighed by the risks posed by widespread e-cigarette use within the community, including the possibility that they may make smoking socially acceptable again. Evidence of this is limited.

The appeal of flavoured e-cigarettes to children and adolescents is also of concern to some, with studies reporting rapid uptake of e-cigarettes among adolescents, in countries where they are readily available.\(^4,5\) These trends may provide cause for concern, given uncertainties about the long-term safety of e-cigarettes. Concerns have also been raised about the potential for e-cigarettes to provide a gateway into nicotine addiction and tobacco cigarette smoking.\(^6,7\) A recent study provides preliminary evidence in support of this, with parallel increases in e-cigarette use and smoking prevalence observed among Polish youth in 2013-14, compared with 2010-11 data.\(^8\) However, further research is needed to establish whether this relationship is causative, and also to determine whether these findings hold true within the Australian context.

Some experts also suggest that e-cigarettes, with or without nicotine, may be harmful. Some have been reported to contain chemicals such as propylene glycol, glycerol or ethylene glycol, which may form toxic or cancer-causing compounds when vaporised.\(^2,9,10,11\) Studies also show that e-cigarettes expose both users and bystanders to particulate matter (very small particles)\(^12,13,14\) that may worsen existing illnesses, or increase the risk of developing diseases such as cardiovascular or respiratory disease.\(^15\) Although these chemicals or particles are typically found in lower concentrations than in tobacco cigarettes,\(^2,3\) in some studies e-cigarettes and tobacco cigarettes were found to produce similar levels of formaldehyde.\(^9,10\) E-cigarette liquids or vapour may also contain potentially harmful chemicals which are not present in smoke from tobacco cigarettes.\(^9,11\)

While some of the chemicals in e-liquid may also be used in food production and are generally considered safe when eaten, this does not mean that these chemicals are safe when inhaled, as a vapour, directly into the lungs. Labelling of e-cigarettes and e-liquids has also been found to be inaccurate, with tests revealing that some products labelled as nicotine free actually contain nicotine.\(^9,16,17\)
Experts also disagree about whether e-cigarettes may help smokers to quit, or whether they will become ‘dual users’ of both e-cigarettes and tobacco cigarettes instead. There is currently not enough evidence to demonstrate that e-cigarettes are effective in assisting people to quit smoking and they have not been approved by the Therapeutic Goods Administration (TGA) for this purpose. Although a recent systematic review conducted by the Cochrane Collaboration\(^1\) found that there is some evidence that e-cigarettes with nicotine may assist smokers to quit, the review authors had a low level of confidence in this finding, due to the small volume of evidence. The review also reported results from one study comparing e-cigarettes with nicotine replacement therapy, which found that both methods resulted in similar rates of smoking cessation at 6 months follow up. However, the reviewers noted that further research is required to enable confidence in these estimates.

Smokers wishing to quit are advised to consult their general practitioner. First line treatments include a range of TGA approved nicotine replacement therapies and prescription medications that have been tested for safety and efficacy. Support and information is also available from the Quitline (13 78 48) or via the Quit Now website www.quitnow.gov.au.

There is currently insufficient evidence to conclude whether e-cigarettes can benefit smokers in quitting, or about the extent of their potential harms. It is recommended that health authorities act to minimise harm until evidence of safety, quality and efficacy can be produced. NHMRC is currently funding research into the safety and efficacy of e-cigarettes for smoking cessation.

NHMRC advises consumers to seek further information about e-cigarettes from reliable sources, such as the relevant State or Territory Health Department or their general practitioner.

The above information is current at the time of writing but is subject to change as more research becomes available.

Where can I get more information?

Australian Competition & Consumer Commission – Electronic Cigarette Safety
www.productsafety.gov.au/content/index.phtml/itemId/999401

Cancer Council Australia and The Heart Foundation – Joint Position Statement on Electronic Cigarettes

Cancer Council – Extreme Caution Needed on E-cigarettes

National Prescribing Service – E-cigarettes: Are They Safe and Will They Help Me to Quit Smoking?

New South Wales Department of Health – Electronic Cigarettes

State and Territory Health Departments – Contact Details
References


