Australian Government
National Health and Medical Research Council

BUILDING
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2022 CEO Statement on Electronic Cigarettes

NHMRC

About the CEO Statement

The safety and health effects of electronic cigarettes (e-cigarettes) are contested. Public health officials have expressed concern at the growing uptake of e-cigarettes, particularly amongst young people. NHMRC has reviewed the current evidence to provide public health advice on the safety and impacts of e-cigarettes.

Key Messages

- E-cigarettes[1] heat liquid containing chemicals to an aerosol that users breathe in. Using an e-cigarette is also known as vaping.
- E-cigarettes can be harmful. All e-cigarette users are exposed to chemicals and toxins that have the potential to cause adverse health effects (1-4).
- E-cigarette-related poisonings have substantially increased over the past 5 years. E-cigarette related calls to Australian Poisons Information Centres have more than doubled between 2020 and 2021. Most poisonings are occurring in toddlers and adults (5-8).
- People who have never smoked may be more likely to take up tobacco smoking if they use e-cigarettes (9).
- Teenagers exposed to e-cigarette content on social media are more likely to try e-cigarettes (10). The World Health Organization recommends that e-cigarettes are treated in the same way as tobacco products, including use of bans and restrictions on advertising, promotion and sponsorship (11).
- There are other proven safe and effective options to help smokers quit. E-cigarettes are not proven safe and effective smoking cessation aids (12). For some smokers, using nicotine e-cigarettes may assist them to quit smoking. However, more research is needed to confirm the harms and benefits of using them for this purpose.
- There are no health benefits of using e-cigarettes for people who do not currently smoke (13). Short-term e-cigarette use may benefit current smokers if they are able to quit smoking and have been previously unsuccessful with other smoking cessation aids (13, 14).
- People seeking additional assistance to quit tobacco smoking or quit e-cigarettes should seek further information from reliable sources, such as their healthcare practitioner or quit services.
- Further research is needed in many areas and NHMRC is currently funding a number of studies investigating e-cigarettes.

1 Electronic cigarettes are also known as e-cigarettes, e-cigs, electronic nicotine delivery systems (ENDS), electronic non-nicotine delivery systems (ENNDS), alternative nicotine delivery systems, personal vaporisers, e-hookahs, vape pens or vapes.

About the evidence

This information is current at the time of writing (February 2022) but is subject to change as more research becomes available. The Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach (15) was used to assess the certainty (quality) of the evidence. The following GRADE terms have been used to describe the evidence: high, moderate, low and very low certainty[2]. The evidence has been presented separately for the following population groups, where appropriate:

- never smokers (those who have never smoked a tobacco cigarette)
- former smokers (those who used to smoke tobacco cigarettes but have quit)
- current smokers (those who currently smoke tobacco cigarettes).

About e-cigarettes

E-cigarettes are battery-operated devices that heat liquid containing chemicals (called 'e-liquid') to produce an aerosol that users inhale (a process known as vaping). The composition of e-liquids varies and they have been reported to contain flavourings (16) and harmful substances such as heavy metals, volatile organic compounds and cancer-causing chemicals (1, 2). These e-liquids can also contain nicotine, even if labelled "nicotine free" (17-19). Nicotine is well understood to be the major addictive substance in tobacco cigarettes (1, 20, 21).

E-cigarettes have changed since first entering the market from products that resemble cigarettes to devices that enable users to modify characteristics of the device, such as adjusting the voltage (2). More recent devices that use nicotine salts rather than freebase nicotine in replaceable pods or disposable devices were very popular in the United States of America in 2020 (22, 23). Disposable e-cigarettes are growing in popularity, particularly among youth (24), and there is high certainty of evidence that e-cigarette use results in fires and environmental waste (13). These are simpler, non-rechargeable devices that enclose a battery and heating coil and generate aerosol from e-liquid (23).

This wide variation in products, including manufacturing quality, and the ability of users to customise their e-cigarette device settings and vary the e-liquid used make it difficult to provide a consistent assessment about the safety and effects of e-cigarettes as a group. However, by examining the evidence to identify common findings across a range of different products or results that are replicated in a number of studies, it is possible to gain insight into the impacts of e-cigarettes, their potential harms and benefits, and areas where further research is required.

2 High certainty: We are very confident that the results from the study are true. Further research is not likely to change this.
Moderate certainty: We are moderately confident that the results from the study are true; however, there are some limitations in the research. Further research may clarify if the results from the study are true.
Low certainty: We have limited confidence that the results from the study are true. There are limitations in the research that will likely affect results. Further research is needed to increase our confidence that the results from the study are true.
Very low certainty: We have very little confidence that the results from the study are true. There are many limitations that affect the results. More and/or higher quality research is needed to address the research question.

Product safety

The following evidence is applicable to all population groups – never smokers, former smokers and current smokers.

E-liquids, chemical exposure and toxicity

E-liquids used in e-cigarettes are a mixture of many chemicals, which can include flavours, solvents and humectants (1, 3, 25). E-liquids have been reported to contain nicotine, even if labelled "nicotine free" (17-19). Recent reports have found over 200 unique chemicals used in e-liquids (1, 3, 25). However, the composition of e-liquids is constantly changing and the chemicals in e-liquids may vary. Chemical exposure from e-cigarette devices is linked to power output of the device and the temperature of the heated coil (3). Chemical exposure is also influenced by dose (quantity of chemicals), duration of use and how users inhale the e-cigarette aerosol (known as vaping style) (3). The variation in the types, quantity and concentrations of the chemicals used in e-liquids and the variation in e-cigarette device type/settings can result in the formation of new chemicals or substances (such as volatile compounds) that are inhaled by the user (1, 26). Chemical exposure from e-cigarette aerosol varies in comparison to tobacco cigarettes. For example, e-liquids or aerosols may also contain potentially harmful chemicals or substances (e.g. volatile compounds, heavy metals, flavourings) which are not present in smoke from tobacco cigarettes (2, 3, 16, 25).

Most of the studies examining the toxicology of e-liquids are *in vitro* or animal-based studies (27). These types of study designs have limitations and are generally considered to provide less direct evidence compared to human randomised controlled trials or long-term epidemiological studies. However, they are useful to obtain a more complete picture of the effects of an environmental exposure to a substance (28, 29). These study designs are also useful where it is not possible or ethical to expose people to potentially toxic substances or to control for confounding factors that are present in human populations (e.g. smoking status) (28, 29).

Some of the chemicals in e-liquids are used in food production, pharmaceuticals and other consumer goods and are generally considered safe when ingested. This does not mean that these chemicals are safe when heated and inhaled as an aerosol directly into the lungs (30). For example, benzyl alcohol, which is used in some e-liquids (3), is approved for use as a flavouring in food in Australia (31). However, it is harmful to inhale based on toxicological assessment data (27). For many of the chemicals used in e-liquids, there is limited information on whether these products are safe to inhale or cause harm in the short or long term (1, 3, 27). A report by the National Academies of Sciences, Engineering, and Medicine (NASEM) concluded that "there is substantial evidence that some chemicals present in e-cigarette aerosols (e.g. formaldehyde, acrolein) are capable of causing DNA damage and mutagenesis" (1) if present in harmful concentrations in the body.

There is high certainty of evidence that e-cigarette use increases airborne particulate matter in indoor environments (13), meaning that people may passively inhale e-cigarette emissions. The report by NASEM concluded that there is "moderate evidence that second-hand exposure to nicotine and particulates is lower from e-cigarettes compared with tobacco cigarettes" (1). The World Health Organization has warned that exposure to any level of particulate matter may be harmful and that levels of exposure should be minimised (32).

Injuries and burns

E-cigarettes have been reported to overheat, catch fire or explode and there is high certainty of evidence that in these cases e-cigarettes cause serious burns and injuries (1, 4, 13), although this is not common. In some cases, these events have resulted in death, life-threatening injury, permanent disfigurement or disability and major property damage (13). Such risk is increased when batteries are of poor quality, stored improperly or modified by users (1). High-power devices tend to have a larger battery capacity and present a greater hazard in the case of a battery explosion (3).

Health effects

There is a perception that e-cigarettes are likely to be less harmful than tobacco cigarettes, because e-cigarettes do not burn tobacco and they generate lower levels of by-products than tobacco cigarettes (10, 33-35). There are differing opinions on the harms and benefits of e-cigarettes. Due to limited long-term evidence, it is difficult to assess the relative harms and benefits of using e-cigarettes compared with smoking tobacco cigarettes. Relative harm from e-cigarette use compared to tobacco cigarettes is difficult to quantify and varies depending on a number of factors such as conditions of use, e-cigarette device type/setting, e-liquid type and concentration, and frequency of e-cigarette and tobacco cigarette use (2, 36). The following evidence is applicable to all population groups – never smokers, former smokers and current smokers – unless otherwise stated.

Adverse and potential health effects

E-cigarettes can be harmful and may expose users to a range of chemicals and toxic substances at levels that have the potential to cause adverse health effects (1-4). Although not common, there is high certainty of evidence from case reports, surveillance reports and case studies that e-cigarette use can lead to seizures (13). There is also high certainty of evidence that intentional or accidental ingestion of nicotine e-liquids can result in poisoning (via nicotine toxicity) which, although not common, can be severe and even fatal (13, 37). Calls to Australian Poisons Information Centres about e-cigarette-related poisonings have substantially increased over the past 5 years, from 102 calls in 2017 to 501 calls in 2021 (5-8). From 2020 to 2021 calls more than doubled, with 218 calls in 2020 and 501 calls in 2021 (5-8). Of the calls reported, 40% related to poisonings in toddlers, 40% in adults and the remainder in infants, children and adolescents (5-8). It is difficult to determine whether the poisonings are solely a result of nicotine as e-cigarettes and/or e-liquids often have unreliable product labelling (5-8).

There is high certainty of evidence that e-cigarette use by smokers and never smokers can result in E-cigarette or Vaping Associated Lung Injury (EVALI) (13). Authors of case reports in the US linked lung injury largely (but not exclusively) to tetrahydrocannabinol (THC) and/or vitamin E acetate containing e-liquids (13, 38). The United States (US) Centres for Disease Control and Prevention (38) reported that 14% of cases of EVALI were in patients who used non-THC-containing e-cigarettes and the contribution of other chemicals in e-liquids cannot be ruled out. There have also been reported cases of EVALI in Australia (39). There is moderate certainty of

evidence that nicotine e-cigarette use likely results in less serious adverse events such as throat irritation, cough, dizziness, headache and nausea (13). There is low certainty of evidence that e-cigarette use can lead to contact dermatitis (13). There is very low certainty of evidence about the effects of e-cigarette use by exclusive e-cigarette users and dual users[3] on pregnancy and fetal outcomes (low birth weight, preterm birth, low Apgar score, small-for-gestational-age birth), corneal epithelial thickness or pre-corneal tear film stability and no evidence from human epidemiological or clinical trials on other optical outcomes, subclinical olfactory measures and subclinical endocrine outcomes of prediabetes and insulin resistance (13).

Given that e-cigarettes are relatively new products, the impact of nicotine e-cigarette use on most clinical outcomes is unknown. There is no available evidence from human epidemiological or clinical trials to date on the effect of nicotine e-cigarettes on clinical and subclinical cardiovascular disease outcomes (such as myocardial infarction, stroke, cardiovascular mortality, carotid intima-media thickness or coronary artery calcification), cancer, and clinical or subclinical oral health outcomes (in exclusive e-cigarettes users), fetal and adolescent brain development, reproductive outcomes, clinical mental health outcomes, clinical neurological outcomes (other than seizures), clinical sleep outcomes, clinical optical outcomes, clinical or subclinical wound healing, clinical olfactory outcomes, clinical endocrine outcomes and haematological outcomes (13).

The absence of evidence does not equal the absence of harm and a precautionary approach to e-cigarettes, particularly among never smokers, remains appropriate. Indirect studies examining substances used in e-liquids demonstrate the potential long-term impacts from e-cigarette use. For example, diacetyl and acetylpropionyl are known to cause irreversible lung damage following repeated inhalation exposure, have carcinogenic potential (40) and are found in both e-cigarettes and tobacco cigarettes, although in different concentrations. In Australia, diacetyl is a prohibited ingredient in nicotine e-cigarettes (12). However, diacetyl has been found in non-nicotine e-cigarette products (3) and non-nicotine e-cigarette users may still be exposed (40). Further research is needed into the health effects, especially long-term direct health effects.

Never smokers

There are no health benefits of using e-cigarettes for never smokers (13). There is low certainty of evidence that e-cigarette use by never smokers may result in decreased acute (up to two hours post-exposure) effects on lung function as measured by spirometry parameters (13). There is very low certainty of evidence about the effects of e-cigarette use by never smokers on other non-clinical or non-subclinical cardiovascular outcomes (such as increased blood pressure, heart rate, autonomic control and arterial stiffness, and reduced endothelial function) and exhaled breath outcomes (13). To date, there is no evidence available from human epidemiological studies on the effect of e-cigarette use by never smokers on other clinical respiratory outcomes (asthma, bronchitis) and other respiratory measures (sinonasal symptoms, airway hyper-responsiveness) (13).

3 Dual users are people who use both e-cigarettes and tobacco products at the same time (United States of America Centers for Disease Control and Prevention; https://www.cdc.gov/tobacco/campaign/tips/diseases/dual-tobacco-use.html (accessed 28 February 2022)).

Former smokers

There is low certainty of evidence that long-term e-cigarette use by smokers after switching from tobacco cigarette smoking may result in decreases in blood pressure (13).

Current smokers

There is moderate certainty of evidence that dual use of e-cigarettes increases heart rate, systolic blood pressure, diastolic blood pressure and arterial stiffness acutely after use (13). There is low certainty of evidence that e-cigarette use by current smokers increases endothelial dysfunction and increases respiratory resistance and impedance (13).

There is very low certainty of evidence about the effect of e-cigarette use by current smokers on other short- and long-term respiratory outcomes (asthma, bronchitis, chronic obstructive pulmonary disease), exhaled breath outcomes, other respiratory measures (sinonasal symptoms, airway hyper-responsiveness), acute (up to two hours post-exposure) effects on lung function as measured spirometry parameters, respiratory exacerbations and disease progression, reduced plaque, gingival and papillary bleeding, and increased gum disease, bone loss around the teeth and periodontal disease (13).

E-cigarette dependency

Never smokers

There is high certainty of evidence that nicotine-containing e-cigarette use can result in increased dependence on e-cigarettes (1, 13). Findings from cross-sectional studies indicate that nicotine-containing e-cigarette dependence may be associated with earlier age of initiation, daily use and later generation/more powerful devices (13).

Current smokers

There is low certainty of evidence that nicotine-containing e-cigarette use may result in increased dependence on e-cigarettes (1, 13). There is also low certainty of evidence that nicotine-containing e-cigarette use may have lower abuse liability[4] than tobacco cigarettes but may have a higher abuse liability than nicotine-replacement therapies (1, 13).

E-cigarette use and uptake

According to the 2019 National Drug Strategy Household Survey use of e-cigarettes in Australia is increasing (41). Between 2016 and 2019, the proportion of people who had ever used e-cigarettes rose from 8.8% to 11.3% (41). An increase in e-cigarette use was reported across most age groups. However, there was a notable increase among youth and young adults. Nearly 2 in 3 (64%) current smokers and 1 in 5 (20%) never smokers aged 18–24 reported having tried e-cigarettes (41). When first using e-cigarettes, 64.5% of youth aged 14–17 and 39% of young adults aged 18–24 were

4 Abuse liability is the likelihood that a drug or a product will be used in excess and produce adverse consequences (Balster RL, Walsh SL. Abuse liability evaluation. In: Stolerman IP, editor. Encyclopedia of Psychopharmacology. Berlin: Springer-Verlag, 2010).

never smokers (41). Among those aged 14 and over who had tried e-cigarettes, frequency of use also increased, with more people using them at least monthly (from 10.3% in 2016 to 17.9% in 2019), weekly (from 2.9% in 2016 to 5.1% in 2019) and daily (from 5.8% in 2016 to 9.4% in 2019) (41).

More than half (54.2%) of Australians who tried e-cigarettes reported that it was done out of curiosity and a third (32.5%) reported that they used e-cigarettes to help quit smoking (41). Use of e-cigarettes out of curiosity was higher in younger age groups than in older age groups, whilst use of e-cigarettes to help quit smoking was reported to be higher in older than in younger age groups (41).

Marketing of e-cigarettes and perceptions that e-cigarettes are less harmful than tobacco cigarettes are commonly cited as potential reasons for increased e-cigarette use and uptake (33, 34, 42, 43). The 2016 US Surgeon General's report concluded that e-cigarette products are marketed through a wide variety of channels that have broad reach among youth and young adults, including television, point-of-sale, magazines, promotional activities, radio and the internet (43). Most of the evidence examining the impact of marketing on e-cigarette related behaviours, such as intentions to use e-cigarettes, e-cigarette uptake/initiation and perceptions about e-cigarettes, is limited to cross-sectional or cohort studies and conducted mainly in the United States of America. Very few studies were conducted in Australia (10). Based on these studies, for most marketing channels, there is very low and low certainty of evidence about the effect of e-cigarette marketing on e-cigarette related behaviours (10). There is moderate certainty of evidence that e-cigarette marketing via social media among adolescents likely results in an increase in e-cigarette uptake/initiation compared with no exposure to e-cigarette marketing via social media (10, 34). The World Health Organization recommends that e-cigarettes are treated in the same way as tobacco products, including the implementation of bans and/or restrictions on advertising, promotion and sponsorship (11). However, the international nature of the internet and social media platforms adds complexities which may impede the effectiveness of current regulations.

The 2016 US Surgeon General's report also concluded that e-cigarettes are marketed by promoting flavours and using a wide variety of media channels and approaches that have been used in the past for marketing conventional tobacco products to youth and young adults (43). In 2021, the European Commission and its Scientific Committee on Health, Environmental and Emerging Risks (SCHEER) concluded that there is "strong evidence that flavours have a relevant contribution for attractiveness of use of e-cigarettes and initiation" (4). NHMRC recognises that further research is needed to understand the role of flavours and packaging design in e-cigarette appeal to young people.

E-cigarette use and tobacco smoking

Tobacco smoking uptake

Although tobacco smoking rates have declined from 12.2% in 2016 to 11.0% in 2019, there is no evidence that this is a result of increased e-cigarette use (41). The decline in tobacco smoking is likely a result of strong tobacco control policies in Australia (44).

Never smokers

A number of scientific reports and studies have reported an association between e-cigarette use in never smokers and uptake of tobacco cigarette smoking in the future (1, 4, 9, 45-48). Most of the studies are observational. Although they can produce high-quality results, observational studies are typically of lower certainty of evidence than randomised controlled trials, due to the influence of known and unknown confounding variables. Observational studies are often the only practical choice of research methodology, particularly where a randomised controlled trial is unethical, such as when examining the impact of e-cigarette use on tobacco smoking uptake.

Never smokers who have used e-cigarettes were more likely to take up smoking tobacco cigarettes compared with never smokers who have not used e-cigarettes (9). While the certainty of evidence is low for the size of the effect, the evidence suggests a clear direction of effect. That is, the evidence suggests that e-cigarette use leads to tobacco cigarette uptake. There is also low certainty of evidence that never smokers who have used e-cigarettes were more likely to transition to become current tobacco smokers compared with never smokers who have not used e-cigarettes (9). The direction of the effect is clear for both of these findings despite the inconsistency in the evidence, and the reasons for this inconsistency (e.g. age, gender, country), and the impact this might have on the magnitude of the effect, need to be explored further in future research.

Tobacco smoking cessation

Current smokers

When examining the evidence on cessation it is important to consider what constitutes effective cessation: sustained cessation of tobacco cigarette use over a number of years, without relapse (49). Most of the evidence examining the efficacy of e-cigarettes as a tobacco cigarette smoking cessation tool is from randomised controlled trials based in clinical settings that had small sample sizes and short follow-up periods (14). Randomised controlled trials are typically considered high-quality evidence. However, the generalisability of the findings in the real world is important to consider. Although observational studies can provide insights on e-cigarettes as a tobacco cessation tool in the real world, a major limitation of these study designs is that the results cannot differentiate between the actual effect (quitting tobacco cigarettes) and what caused people to quit (e.g. e-cigarettes or other unmeasured factors, such as motivation or support from friends and family). The NASEM review, which included randomised controlled trials and observational

studies, concluded that "there is limited evidence that e-cigarettes may be effective aids to promote smoking cessation" despite mixed findings from observational trials (1). It is also important to consider that the evolving variation in device type, e-liquids used, and the dose and nature of nicotine delivered presents challenges when making generalisations about efficacy of e-cigarettes as a product group for cessation based on clinical trials (14, 50).

There is low certainty of evidence that, in clinical settings, nicotine e-cigarettes may be more effective for smoking cessation than existing cessation aids such as counselling or nicotine replacement therapies (14). There is also low certainty of evidence that nicotine e-cigarettes may be more effective than no intervention or usual care (14). There is very low certainty of evidence about the effectiveness of nicotine e-cigarettes for smoking cessation compared to non-nicotine e-cigarettes (14). There is also very low certainty of evidence about the effectiveness of non-nicotine e-cigarettes for smoking cessation compared to counselling or other nicotine replacement therapies (14). No brand of e-cigarette has been approved by the Therapeutic Goods Administration (TGA) as a cessation tool. Trials demonstrating efficacy were limited to products with freebase nicotine concentrations ≤20 mg/mL (14). Smokers who used nicotine e-cigarettes were more likely to be using nicotine in any form at six-to-twelve-month follow-up than smokers who used approved forms of nicotine replacement therapy (14). In smokers randomised to nicotine e-cigarettes, dual use was more common than quitting at trial completion (14).

A 2021 systematic review conducted by the Cochrane Collaboration (51) found moderate certainty of evidence that nicotine-containing e-cigarettes increase quit rates compared to nicotine replacement therapies and non-nicotine e-cigarettes (51). However, the authors of the study noted that the certainty of the finding is limited due to the small volume of randomised controlled trials (51).

The safety, efficacy and performance of specific products and components are not known, even when they are accessed on prescription. Due to the high level of uncertainty in the evidence of efficacy of e-cigarettes for smoking cessation, smokers wishing to quit should seek further information about e-cigarettes from reliable sources, such as the relevant Commonwealth, State or Territory Health Department, their healthcare practitioner or quit services. There are several other proven safe and effective cessation aids available to try before e-cigarettes. Support and information are also available from the Australian Government Department of Health website or via one of the following smoking and tobacco contacts.

Relapse to tobacco smoking

Former smokers

There is low certainty of evidence that use of e-cigarettes by former smokers may result in an increased likelihood of smoking relapse compared with former smokers who do not use e-cigarettes (9, 52).

Using the evidence

The evidence on e-cigarettes is constantly evolving. E-cigarettes are relatively new products and most of the direct evidence on e-cigarettes is limited to short-term studies. Indirect evidence, such as studies that examine the long-term health effects of substances used in e-liquids, such as nicotine or formaldehyde, can be useful to obtain a more complete picture of the safety and potential long-term impacts of e-cigarette use. Where appropriate, it is important to consider both direct and indirect evidence.

When reading published research, it is important to use recognised tools to assess the evidence for quality and bias and to manage conflicts of interest. Study quality and study design are interrelated. Generally speaking, quality reflects how well a study was designed and how well it was executed (53). Study design can affect quality and not all study designs are appropriate for all research questions (53). Where appropriate, it is important to synthesise evidence from different studies whilst considering the limitations of different study designs and the potential impact of these limitations on the results.

When reading published research on e-cigarettes, it is also important to consider whether the authors of the research had any conflicts of interest that could bias their findings or whether the research was funded by an organisation with a financial interest in the outcomes, such as e-cigarette manufacturers (54). Research is known to be summarised and reproduced; it is also important to consider potential conflicts of interest that may bias the publisher's interpretation of the evidence.

NHMRC recognises that long-term, high-quality research continues to be needed about the safety and health effects of e-cigarettes and their appeal, particularly in youth and other priority groups (such as Aboriginal and Torres Strait Islander and lower socio-economic populations).

Resources

Evidence-based reports

Committee on Toxicity of Chemicals in food, consumer products and the environment (COT) – Statement on the potential toxicological risks from electronic nicotine (and non-nicotine) delivery systems (E(N)NDS – e-cigarettes (2020)

https://cot.food.gov.uk/sites/default/files/2020-09/COT%20E%28N%29NDS%20statement%202020-04.pdf

National Academies of Sciences, Engineering, and Medicine – Public health consequences of e-cigarettes (2018)

https://www.nap.edu/catalog/24952/public-health-consequences-of-e-cigarettes

National Centre for Epidemiology and Population Health, Australian National University – Efficacy of e-cigarettes as aids to cessation of combustible tobacco smoking: updated evidence review. A report for the Australian Department of Health (2021)

https://openresearch-repository.anu.edu.au/bitstream/1885/247864/1/Updated%20Evidence%20Review%20EC%20and%20Cessation%20for%20online%20publication%20210915.pdf

National Centre for Epidemiology and Population Health, Australian National University – Electronic cigarettes and health outcomes: systematic review of global evidence. A report for the Australian Department of Health (2022) https://openresearch-repository.anu.edu.au/bitstream/1885/262914/1/Electronic%20cigarettes%20health%20outcomes%20review_2022_WCAG.pdf

National Health and Medical Research Council – Toxicology of non-nicotine e-cigarette constituents: risk assessments, scoping review and evidence map (2022) https://www.nhmrc.gov.au/about-us/publications/e-cigarettes/ceo-statement#download

National Industrial Chemicals Notification and Assessment Scheme – Non-nicotine liquids for e-cigarette devices in Australia: chemistry and health concerns (2019)

https://www.industrialchemicals.gov.au/sites/default/files/2020-08/Non-nicotine%20liquids%20for%20e-cigarette%20devices%20in%20Australia%20chemistry%20and%20health%20concerns%20%5BPDF%201.21%20MB%5D.pdf

National Institute Health and Care Excellence – Tobacco: preventing uptake, promoting quitting and treating dependence (2021)

https://www.nice.org.uk/guidance/ng209/resources/tobacco-preventing-uptake-promoting-quitting-and-treating-dependence-pdf-66143723132869

Public Health England – Vaping in England: an evidence udpate including vaping for smoking cessation (2021)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/962221/Vaping_in_England_evidence_update_February_2021.pdf

Scientific Committee on Health Environmental and Emerging Risks (SCHEER) – Scientific Opinion on electronic cigarettes (2021)

https://ec.europa.eu/health/system/files/2021-04/scheer_o_017_0.pdf

The Royal Australian College of General Practitioners – Supporting smoking cessation: A guide for health professionals (2021)

https://www.racgp.org.au/clinical-resources/clinical-guidelines/key-racgp-guidelines/view-all-racgp-guidelines/supporting-smoking-cessation/about-this-guideline

The Royal College of Physicians – Smoking and health (2021)

https://www.rcplondon.ac.uk/file/30236/download

US Centers for Disease Control and Prevention – E-Cigarette, or Vaping, Products Visual Dictionary

https://www.cdc.gov/tobacco/basic_information/e-cigarettes/pdfs/ecigarette-or-vaping-products-visual-dictionary-508.pdf

US Preventive Services Task Force Recommendation Statement – Interventions for Tobacco Smoking Cessation in Adults, Including Pregnant Persons

https://jamanetwork.com/journals/jama/fullarticle/2775287

World Health Organization – Electronic Nicotine Delivery Systems and Electronic Non-Nicotine Delivery Systems (ENDS/ENNDS) (2016)

https://www.who.int/publications/m/item/background-papers-to-the-who-report-on-electronic-nicotine-delivery-systems-and-electronic-non-nicotine-delivery-systems-(ends-ennds)

Information, fact sheets and FAQs from government departments

ACT Health – Electronic Cigarettes

https://www.health.act.gov.au/about-our-health-system/population-health/smoke-free-environments/electronic-cigarettes accessed 01/02/2022

Australian Government Department of Health – About e-cigarettes

https://www.health.gov.au/health-topics/smoking-and-tobacco/about-smoking-and-tobacco/about-e-cigarettes accessed 01/02/2022

Australian Government Department of Health – State and Territory Health Departments – Contact Details

https://www.health.gov.au/about-us/contact-us/local-state-and-territory-health-departments accessed 01/02/2022

Australian Industrial Chemical Information Scheme – E-cigarettes and personal vaporisers

https://www.industrialchemicals.gov.au/consumers-and-community/e-cigarettes-and-personal-vaporisers accessed 01/02/2022

New South Wales Health – Electronic Cigarettes

https://www.health.nsw.gov.au/tobacco/Pages/e-cigarettes.aspx accessed 01/02/2022

Product Safety Australia – Electronic Cigarette Safety

https://www.productsafety.gov.au/products/health-lifestyle/personal/tobacco-related-products/electronic-cigarettes accessed 01/02/2022

Queensland Health – Electronic Cigarettes

https://www.health.qld.gov.au/public-health/topics/atod/tobacco-laws/electronic-cigarettes accessed 01/02/2022

Therapeutic Goods Administration – Nicotine Vaping Products

https://www.tga.gov.au/nicotine-vaping-products accessed 01/02/2022

Victorian Department of Health, Better Health Channel – E-cigarettes
https://www.betterhealth.vic.gov.au/health/healthyliving/e-cigarettes

Western Australia Department of Health – Electronic cigarettes (e-cigarettes)
https://www.healthywa.wa.gov.au/Articles/A_E/Electronic-cigarettes-e-cigarettes
accessed 01/02/2022

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